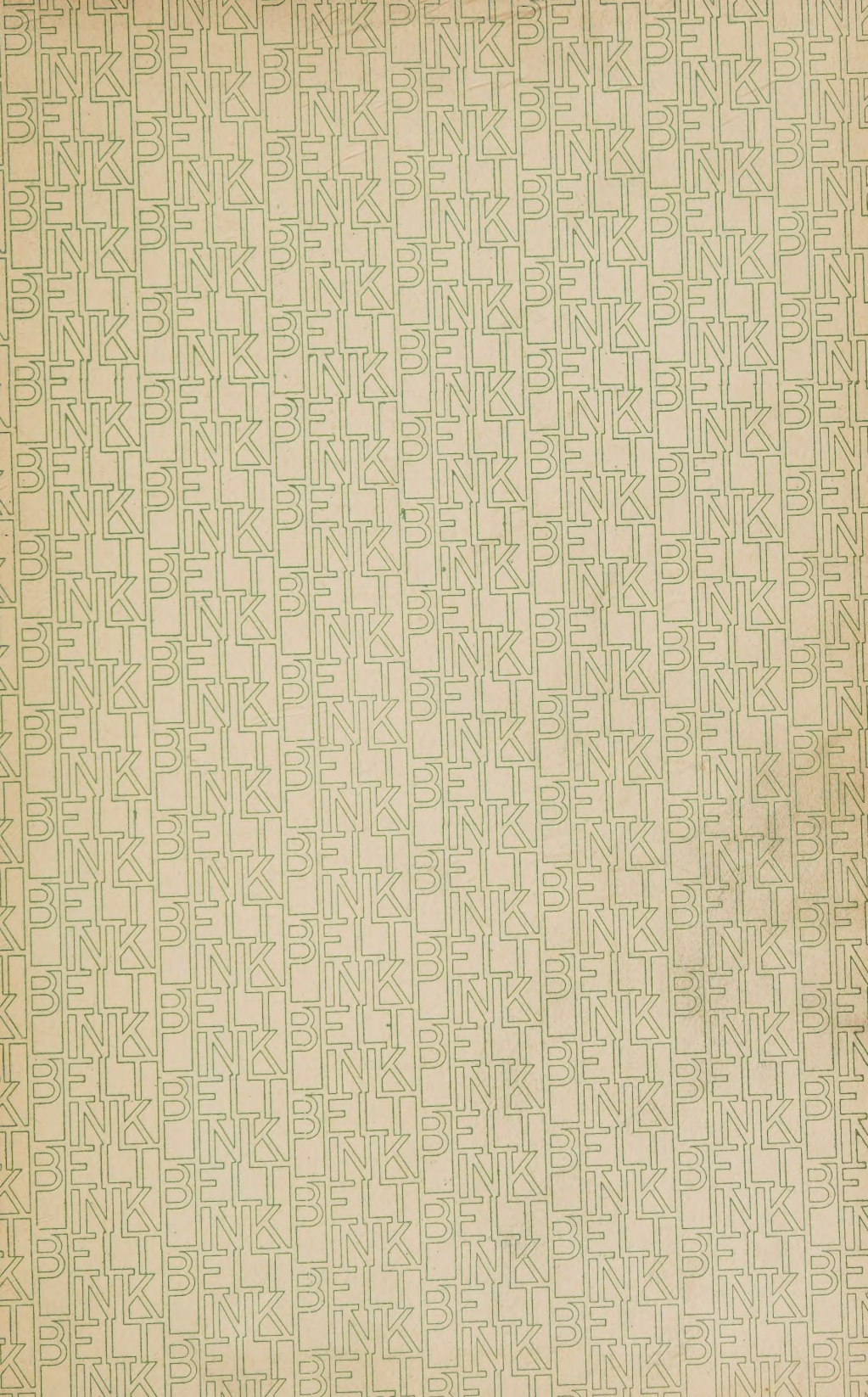


**LINK-BELT
ENGINEERING
COMPANY**





MODERN METHODS

APPLIED *to the* ELEVATING
AND CONVEYING OF
MATERIALS AND THE
TRANSMISSION *of* POWER

Book Number 37
1904

"Times change and we move with them"

THE LINK-BELT ENGINEERING COMPANY
PHILADELPHIA, PA.

JAMES M. DODGE, President

S. HOWARD-SMITH, Vice-President and Treasurer

EDWARD H. BURR, Secretary

CHARLES PIEZ, Gen'l Mgr. and Chief Engineer

P. G. REID, Assistant Treasurer

J. A. MESA, Superintendent

49 DEY STREET, NEW YORK and
1501-2 PARK BLDG., PITTSBURG

New York Office under Direction of
CHARLES A. FRY, Chief Engineer
HUMPHREY J. KIELY, Manager

Pittsburg Office
T. F. WEBSTER, Manager

CHICAGO — THE LINK-BELT MACHINERY COMPANY

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PHILADELPHIA, PA.
1904

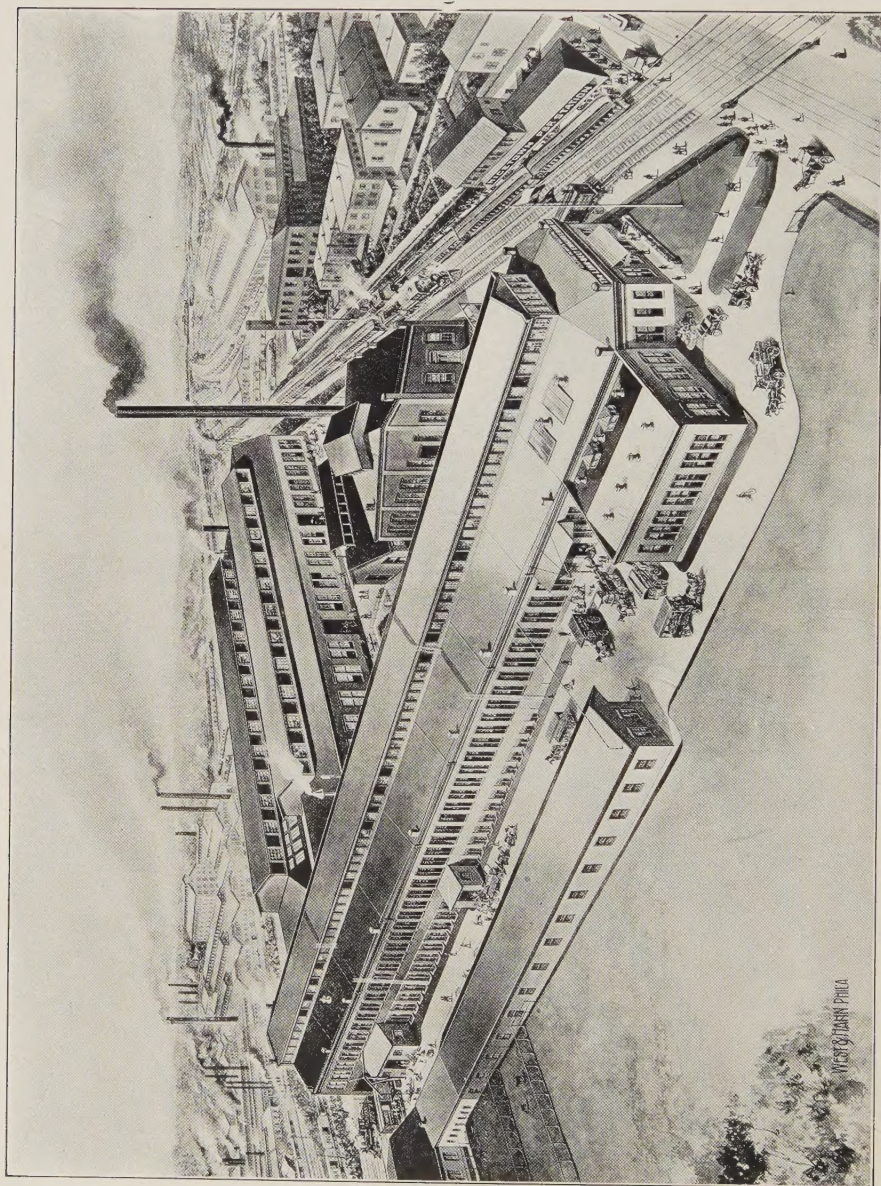
CABLE ADDRESS: CHAINBELT

Price Lists given in this Catalogue supersede all others and are subject to change without notice.

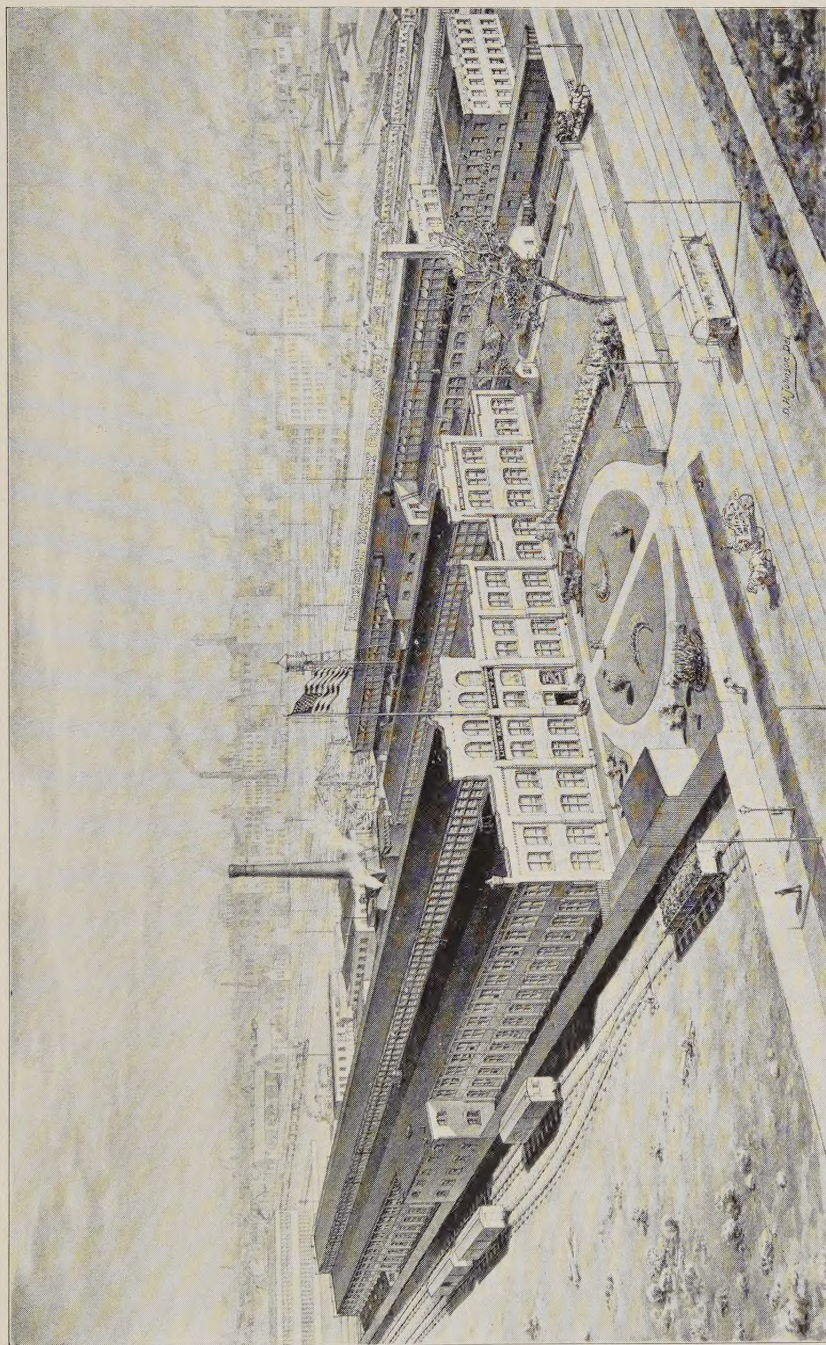
SIZE OF CATALOGUE

THIS CATALOGUE is made 6 x 9 inches, the dimensions recommended by the American Society of Mechanical Engineers for a standard size of machinery catalogues. This makes it possible to bind into one book for reference such catalogues of machinery as are most used, or found desirable.

REGISTERED TRADE-MARK : LINK-BELT



BIRD'S-EYE VIEW OF THE LINK-BELT ENGINEERING COMPANY'S WORKS
Philadelphia, Pa.



OFFICE AND WORKS OF THE LINK-BELT MACHINERY COMPANY
Chicago, Ill.

Link-Belt Engineering

A STORY of Achievement told by
Photographs of Plants, Installations
and Machines, with a Record of Inven-
tions, Improvements and Refinement of
Detail, to which are added some Tabulated
Memoranda for the Engineer, and the Prices
of Listed Elements of our Manufacture.

Structural Steel

IN the earlier years of our business, timber was generally employed to support elevating and conveying machinery. Millwrights and carpenters were therefore an important part of our force. The lessening cost of steel has made it possible to substitute metal for wood in structural work to a very large extent, and in 1890 we added to our works a Structural Steel Department.

This has grown in relative importance. The building has been greatly enlarged and fully equipped with tools of best design for accurate and economical work.

We now design and build in our own shops not only the steel work of all our installations, but structural work in all branches, including

ANGLE, CHANNEL AND BEAM WORK

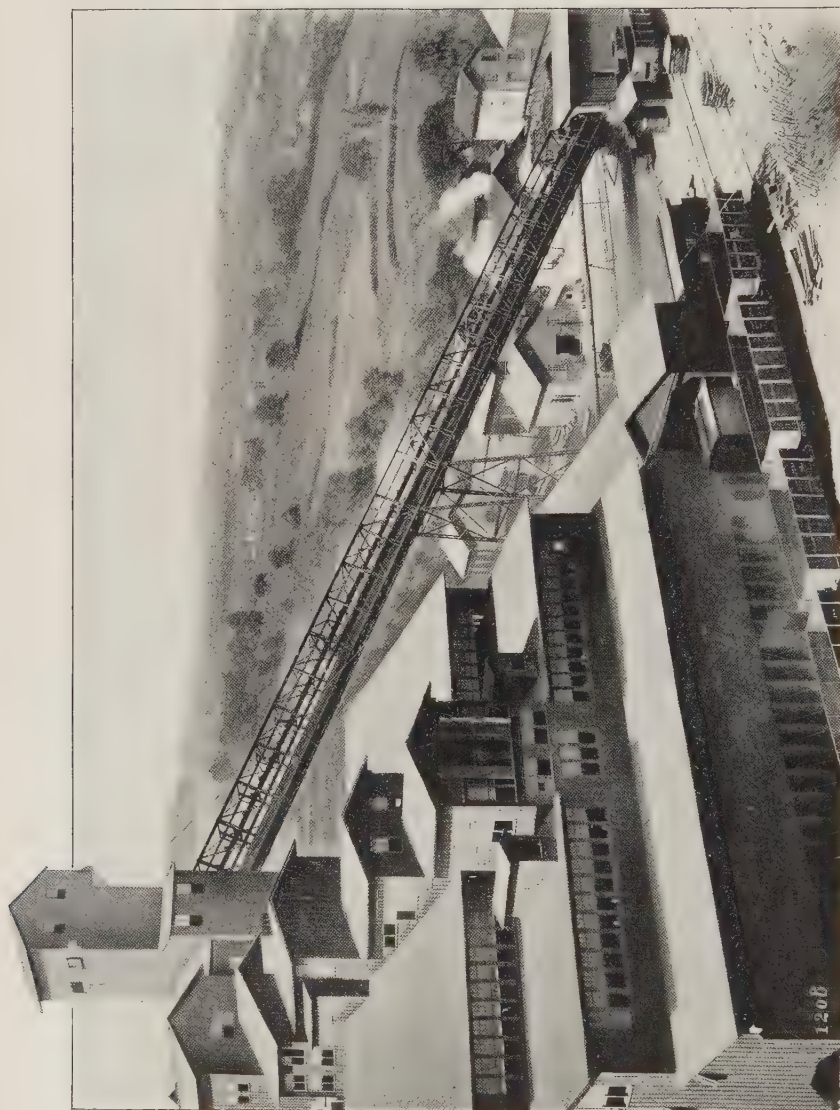
(Towers, Trusses, etc.)

SHEET AND TANK CONSTRUCTIONS

Elevator Casings, Water and Oil Tanks,
Coal and Ash Cars for Industrial Plants, etc.

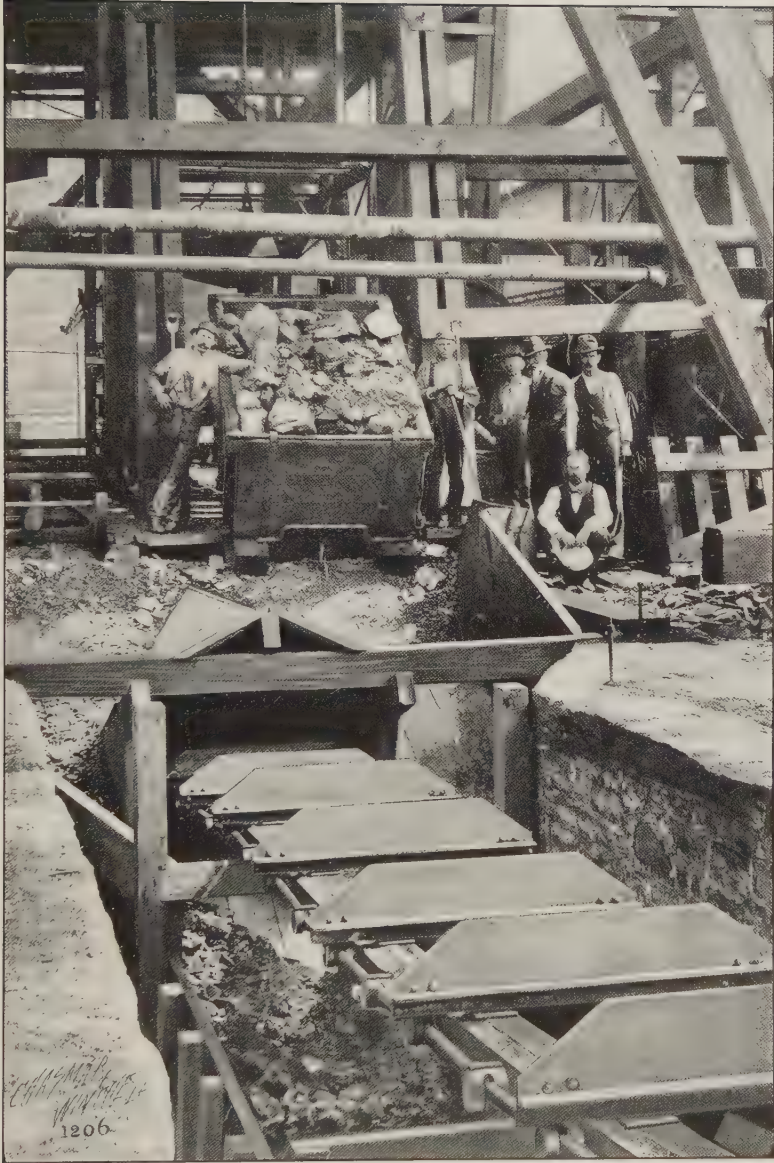
CORRUGATED IRON WORK INTRICATE SHAPES

Careful and accurate work at lowest prices compatible with the standard we maintain is offered our customers in this as in all other departments of our manufacture.



MONOBAR CONVEYOR 272 feet

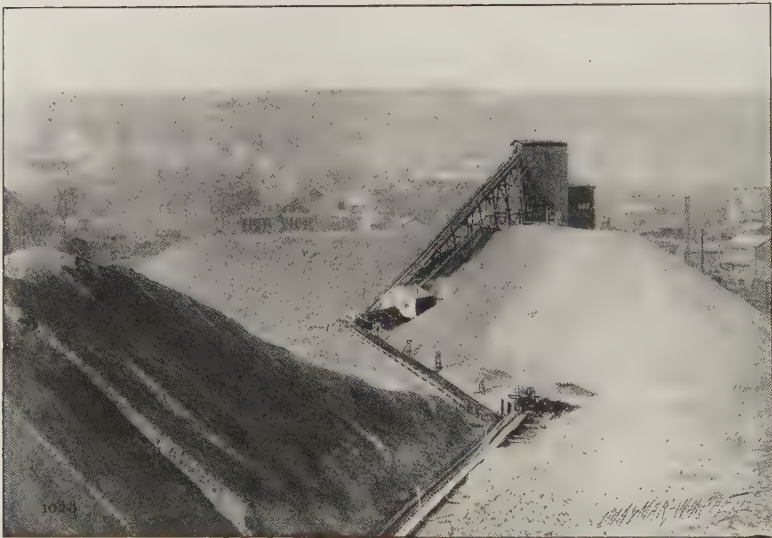
Running from mouth of shaft to head of Boston Breaker, D. & H. Co., Plymouth, Pa. Run-of-mine coal conveyed at the rate of four tons per minute. Similar conveyors of even greater length and capacity have been installed and are in regular service at other anthracite breakers. The uniform delivery by the conveyor has been found to increase the output of the breaker on one hand and reduce cost of handling on the other. Fewer men are required than when the cars themselves were *hauled* to the breaker head, and the breaker itself is relieved of the destructive intermittent strains of the haulage system.



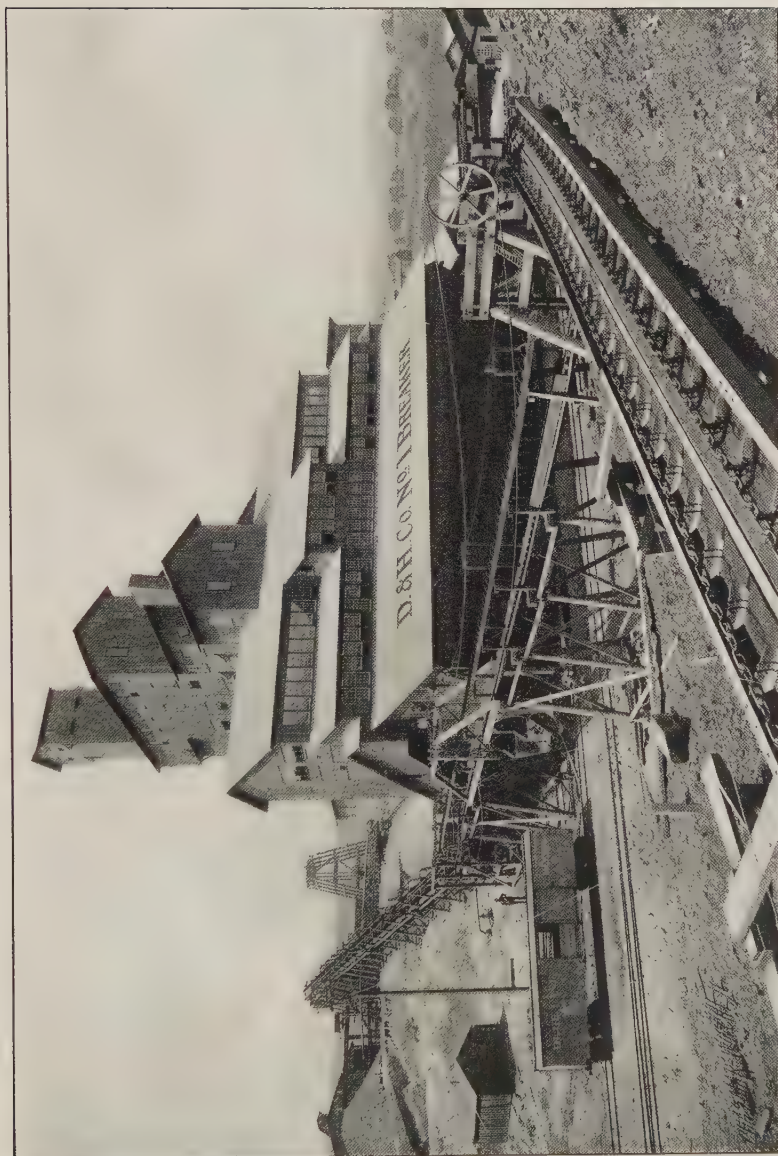
Tipple at D. & H. Co.'s Boston Mine, showing delivery of coal to Monobar Conveyor which carries it to head of breaker.



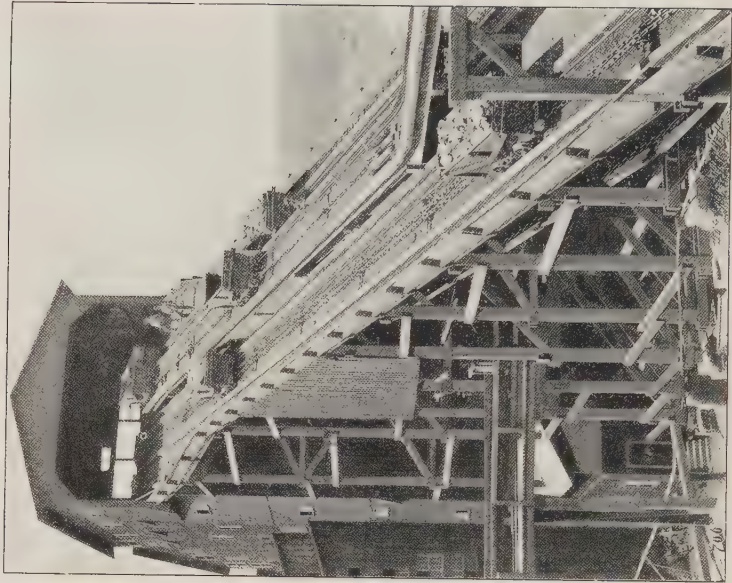
FROM BREAKER TO BANK ; CULM AND SLATE CONVEYOR
Coxe Bros. & Co.'s Iron Breaker, Drifton, Pa.



RECLAIMING COAL FROM CULM BANKS
is made profitable by use of modern methods. The photograph shows our patented swinging conveyor, which follows up the receding face of the bank as the working proceeds and delivers the culm to the fixed horizontal and inclined conveyors leading to the washery.



FILLING OLD WORKINGS WITH CULM FROM WASTE BANK AND BREAKER



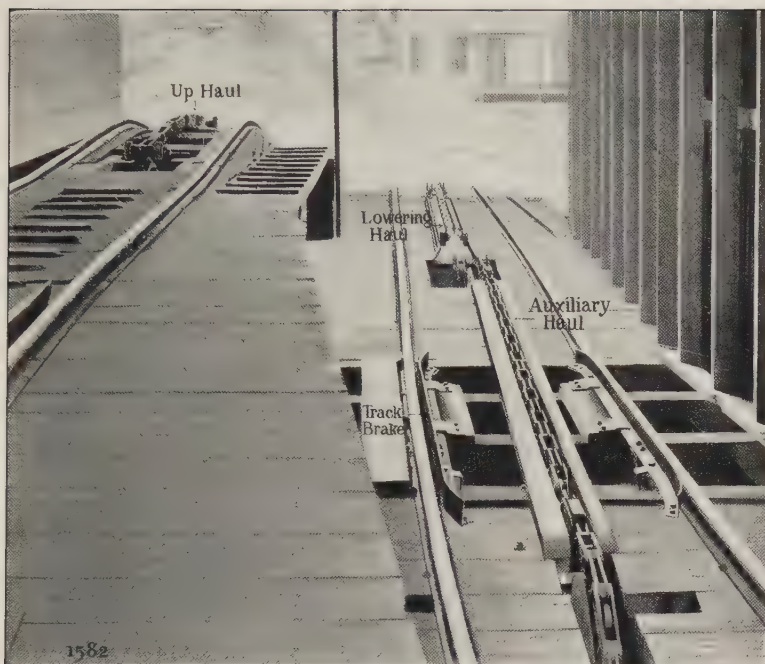
LINK-BELT CAR HAUL

Into No. 7 Breaker of the Susquehanna Coal Co., Nanticoke, Pa. Length, 200 feet; capacity, two cars per minute. Employs one lowering haul and two lifting hauls.



LINK-BELT CAR HAUL

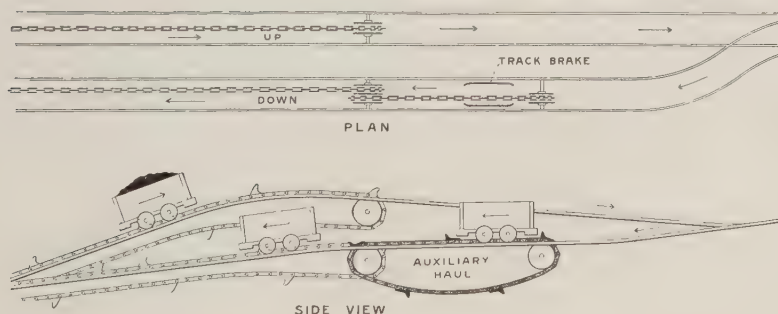
Installed for United Coal Company, Meadow Lands, Pa. Employs Link-Belt "Auxiliary Haul" for delivering cars to down haul.



LINK-BELT AUXILIARY CAR HAUL

Patented March 15, 1898

For delivering mine cars to the down haul without shock



This drawing illustrates the principles of the Link-Belt Auxiliary Car Haul and Track Brake, in successful operation for retarding the speed of empty mine cars after leaving the shifting track. Delivers them absolutely without shock to the hooks of the down haul chain. Also saves the labor of one man in making the transfer from up-haul to down-haul.

COAL AND COKE CRUSHERS

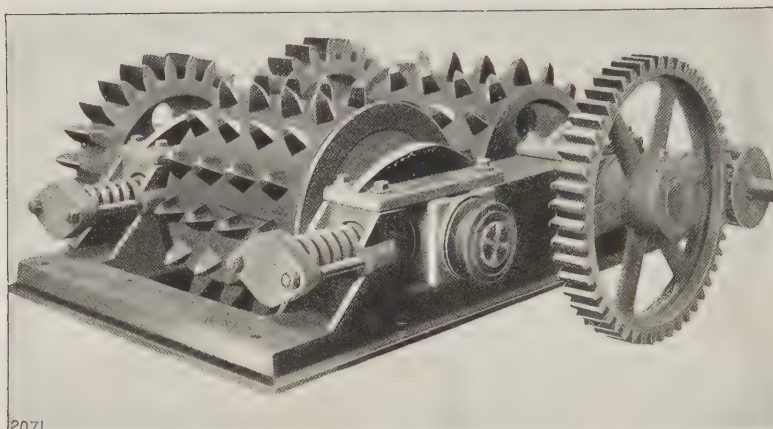
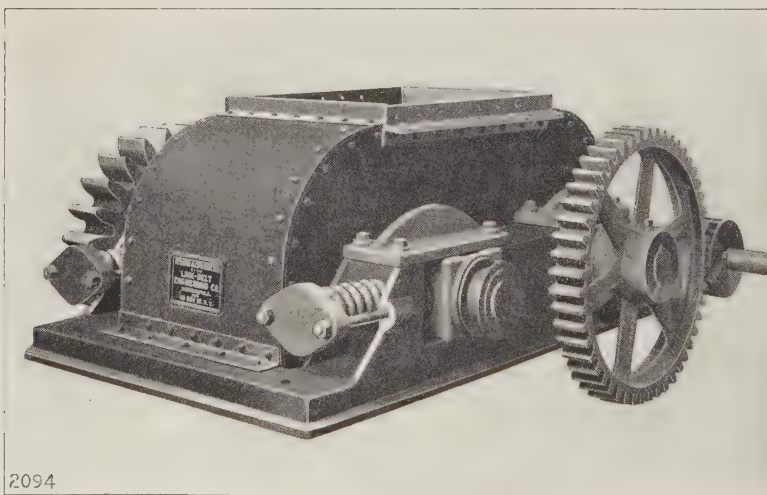


Plate 2071 shows the Standard Two-Roll Crusher, with hood removed. The rolls are made of the best charcoal iron cast in chills, and are very tough and durable. Relief springs are provided and the frame is fitted with a counter shaft, to which power is applied. It is made in these sizes :

1. Rolls 17" diameter x 24" long, will reduce run-of-mine bituminous, with lumps not exceeding 10" x 10", to 2½" size and less, at the rate of 30 tons per hour ; requires about 5 HP.
2. Rolls 28" diameter x 24" long, with coarse teeth ; will reduce run-of-mine bituminous, with lumps not exceeding 12" x 20", to 4" size and under, at the rate of 50 tons per hour ; requires from 6 to 10 HP.
3. The same frame fitted with fine tooth rolls, of the same size ; will crush to 2½" size and under, at the rate of 40 tons per hour.
4. Rolls 28" diameter x 36" long. This machine will reduce run-of-mine bituminous to 2½" and under, at the rate of 70 tons per hour ; requires from 10 to 15 HP.



Standard 28" x 24" Two-Roll Crusher, with hood in place.

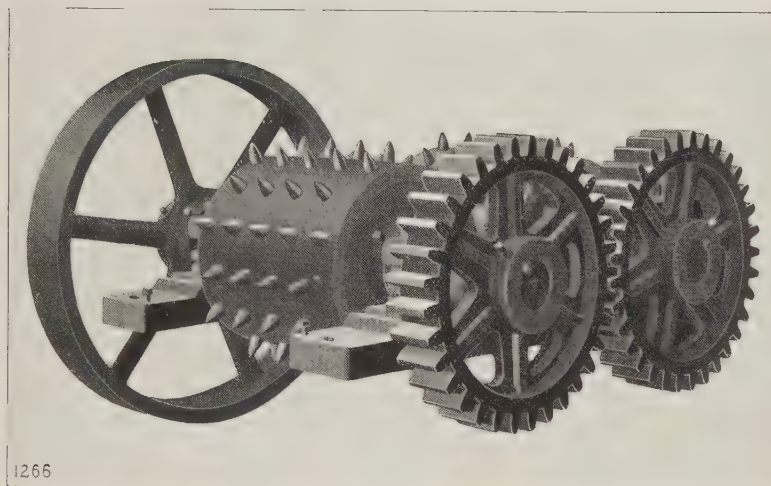
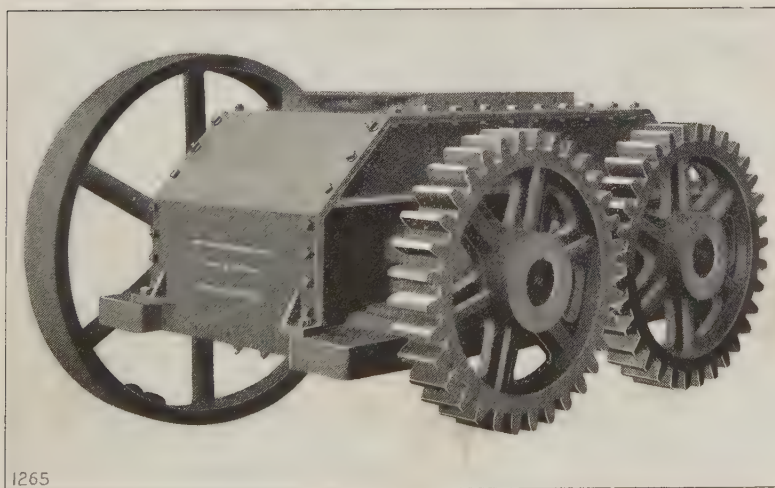


Plate 1266 shows two-roll crusher with inserted steel teeth and housing removed. Rolls are 29" diameter and 32" long. Will reduce run-of-mine coal to about 4" and under. Will crush 90 tons per hour, and requires about 20 HP.

Suitable for plants that require coarse crushing with smallest possible amount of pulverizing.



Inserted Steel Tooth Crusher with Cast Iron Housing.

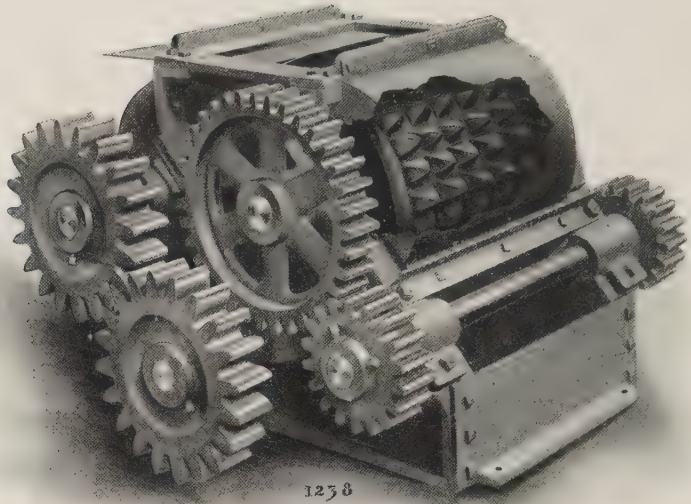
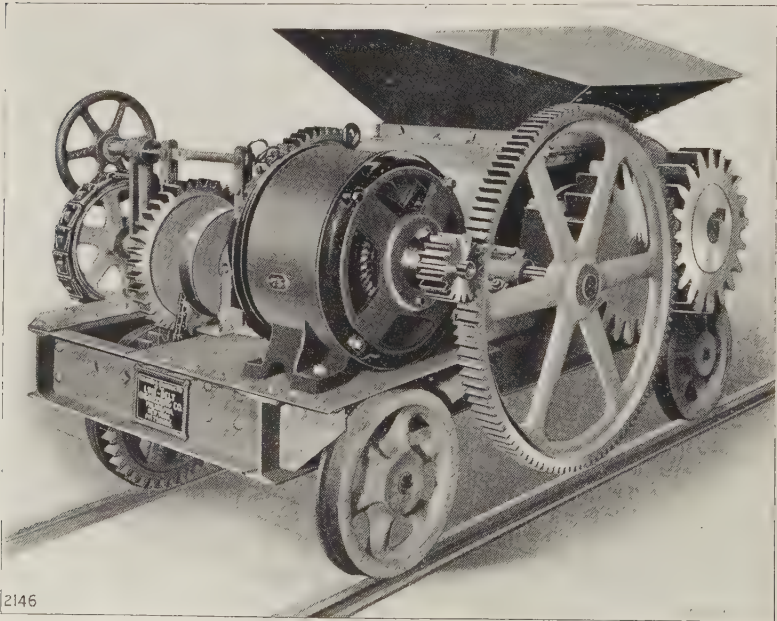


Plate 1238 shows Standard Three-Roll Crusher with part of hood removed. Will reduce run-of-mine bituminous coal to about 2" and under, at the rate of 40 tons per hour. Requires about 15 HP.
This crusher does not lend itself to the reduction of coal that runs very large.



Self-Propelling Two-Roll Crusher, driven by an electric motor

FLUTED-ROLL CRUSHERS FOR FINE CRUSHING

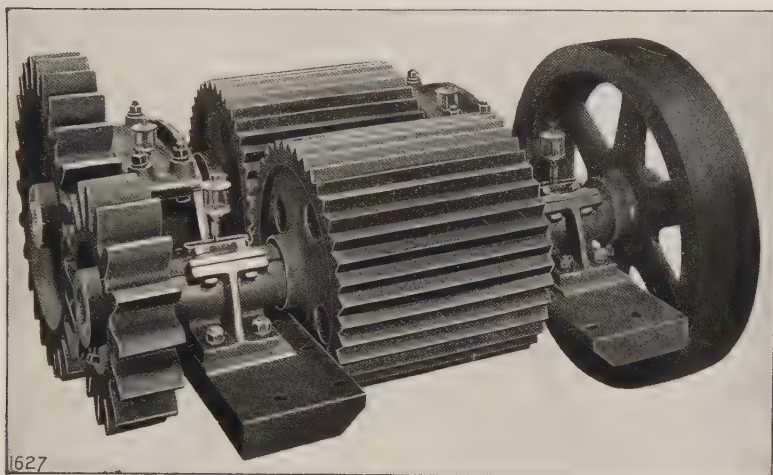


Plate 1627 shows a Two-Roll Crusher for fine crushing. The rolls are of the best charcoal iron cast in chills, and are geared to run at differential speeds, so as to produce a tearing action on the lumps of coal. This class of crusher is made in these sizes:

1. Rolls 20" diameter x 18" long; will reduce 3" and 4" lumps to 1" and less, at the rate of 15 tons per hour; requires 6 HP.

2. The same sized rolls with finer corrugations; will reduce 3" and 4" lumps to $\frac{3}{8}$ " and less, at the rate of 10 tons per hour; requires 6 HP.

3. Rolls 46" diameter x 36" long, with grooves $1\frac{3}{4}$ " wide by $1\frac{1}{4}$ " deep; will reduce largest run-of-mine bituminous so that 90 per cent. will go through 1" mesh at the rate of 130 tons per hour; requires 30 HP. motor.

4. The same sized rolls with grooves 1" wide and $\frac{5}{8}$ " deep; will reduce largest run-of-mine bituminous so that 90 per cent. will pass $\frac{3}{4}$ " mesh at the rate of 80 tons per hour; requires 30 HP. motor.

5. Rolls 26 $\frac{1}{2}$ " diameter, 24" long, with grooves $\frac{1}{2}$ " deep, mounted in the frame shown in plate 2071 on page 14; used at coke plants for the first reduction of run-of-mine; capacity 50 tons per hour; requires about 10 HP. This machine is not for fine crushing.

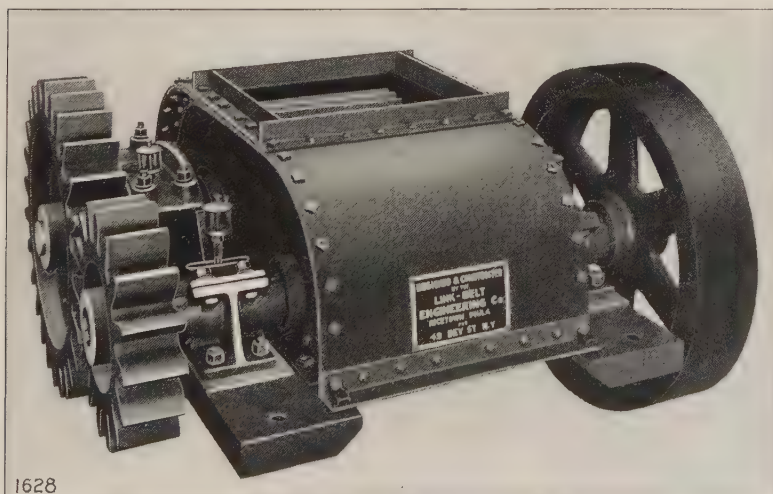
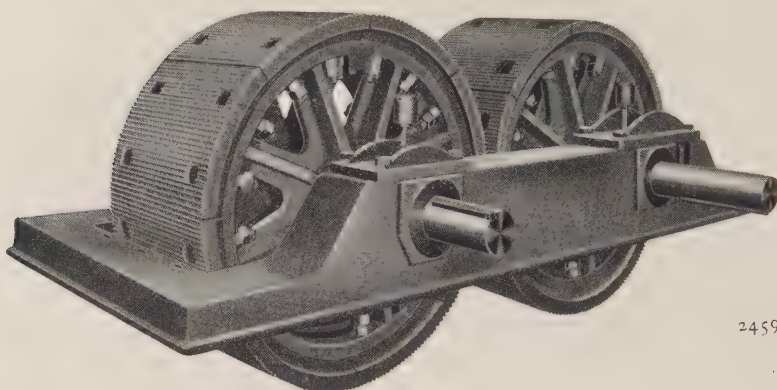


Plate 1628 shows 20" x 18" Fine Coal Crusher with Hood in place.

LINK-BELT DISINTEGRATORS

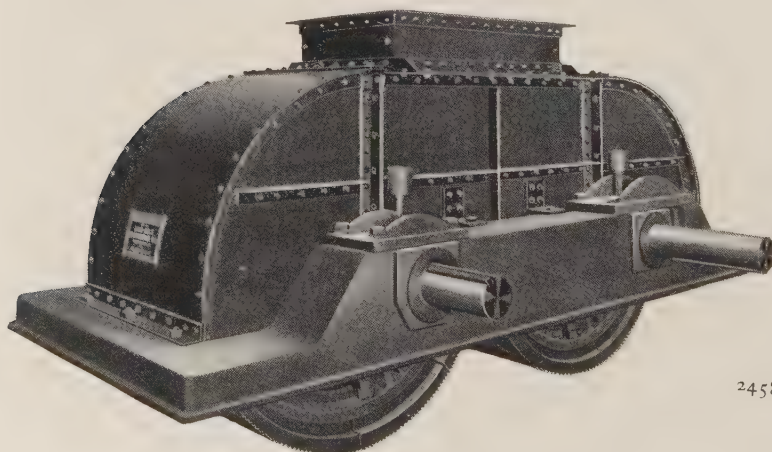


2459

Disintegrator with steel housing removed

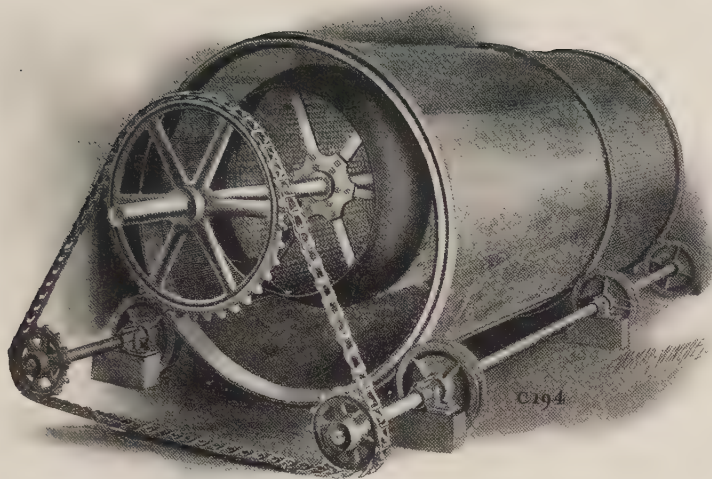
For very fine crushing of coal, required in cement works and in by-product coke oven plants, it is necessary to use a set of disintegrating rolls in addition to the crushing rolls; by this means run-of-mine coal can be reduced to $\frac{1}{8}$ " diameter and under. To obtain the best results, either stationary or power screens should be placed between the crushers and the disintegrator.

The disintegrators are made in two sizes: 36" diam., 20" face; 48" diam., 24" face.

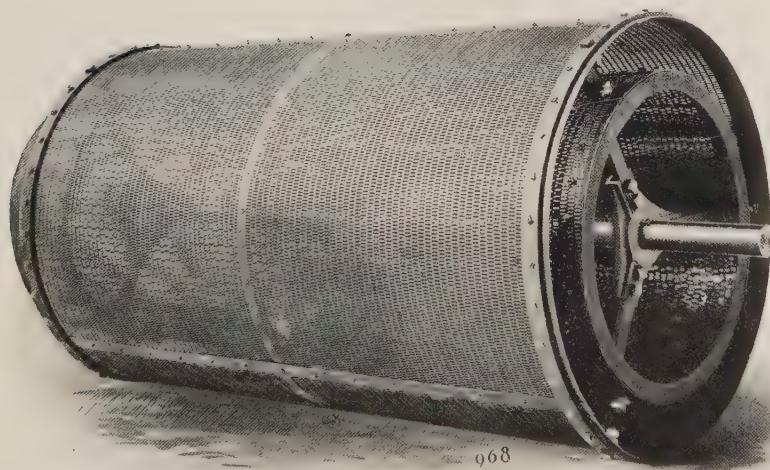


2458

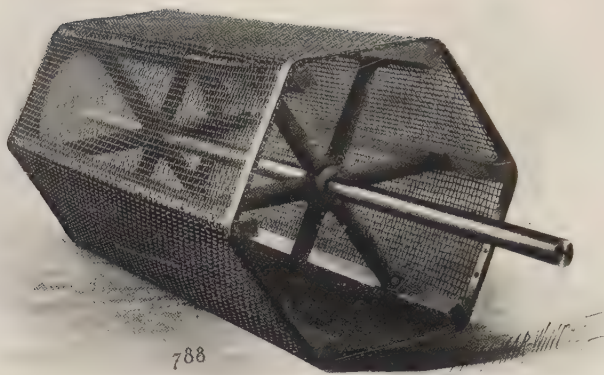
Disintegrator with steel housing



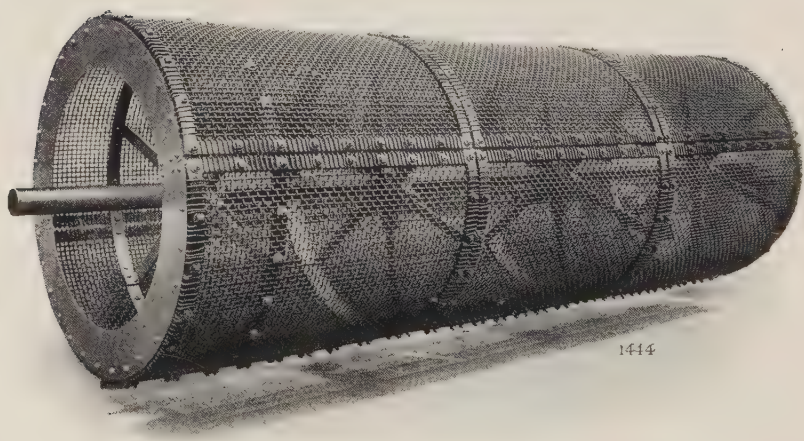
DOUBLE REVOLVING SCREEN
Screens independent and eccentric



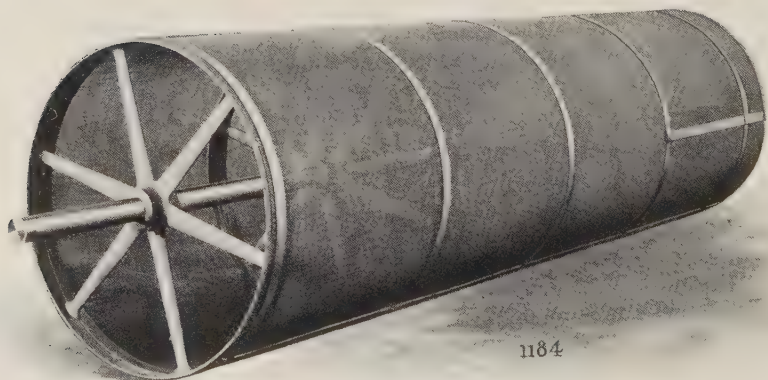
JACKETED SCREEN FOR WET COAL
Perforated metal



HEXAGONAL SCREEN FOR SAND AND COKE



SCREEN FOR SOFT COAL



PHOSPHATE SCREEN

THE LINK-BELT COMPANIES have erected more and larger COAL HANDLING MACHINERY than any other company in the world. They have built all of the machinery for the plants of the Dodge System. If interested, send for special catalogue to

The Dodge Coal Storage Co.

Nicetown, Philadelphia, Pa.

Complete Plants for Stocking and Reloading

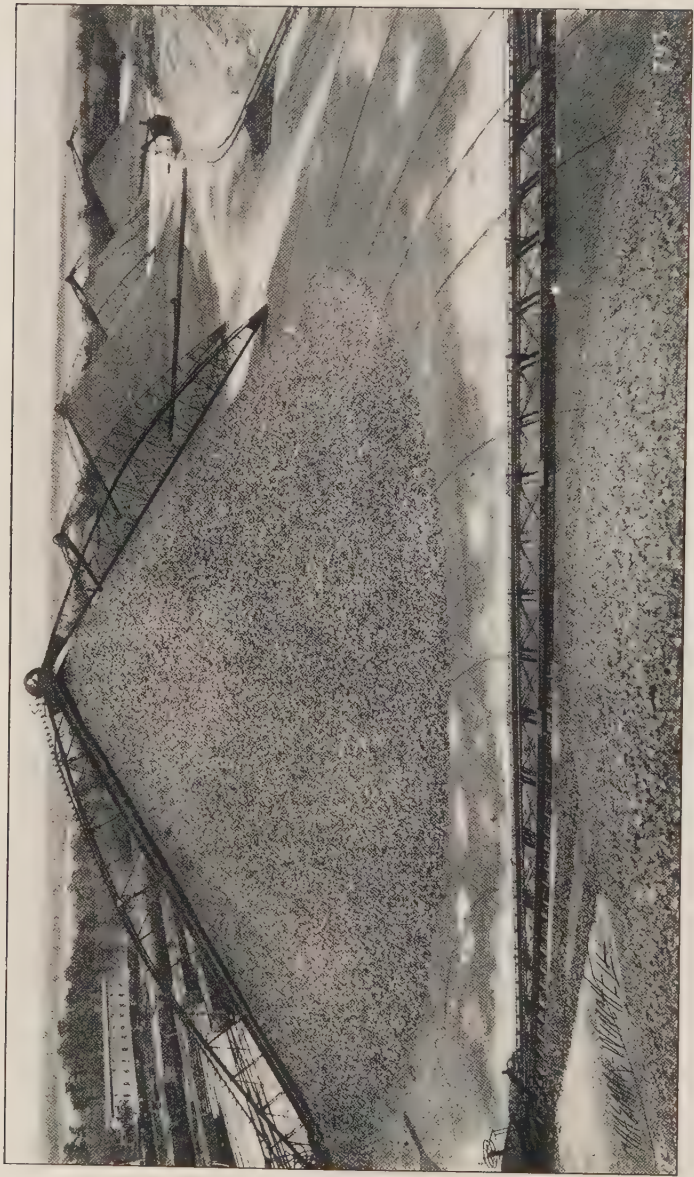
C O A L

in any quantity, with greater speed, less breakage and at lower cost than by any other known method.

Their system installed and in use to date provides for the storage of 2,360,000 tons of anthracite coal, as follows:

P. & R. Ry. Co.	Port Richmond, Phila., Pa.	180,000 tons
P. R. R. Co.	South Amboy, N. J.	100,000 "
P. R. R. Co.	South Amboy, N. J. (2d plant)	90,000 "
D. & H. Co.	Carbondale, Pa.	150,000 "
D. & H. Co.	Delanson, N. Y.	120,000 "
C. R. R. of N. J.	Hampton Junction, N. J.	180,000 "
C. R. R. of N. J.	Salem, Mass.	80,000 "
L. V. Coal Co.	South Plainfield, N. J.	310,000 "
L. V. Coal Co.	West Superior, Wis.	100,000 "
G. L. & C. Co.	London, England	30,000 "
Erie R. R.	Buffalo, N. Y.	150,000 "
Erie R. R.	Hammond, Ind.	60,000 "
Erie R. R.	Rochelle Park, N. J.	200,000 "
Pennsylvania Coal Co.	Newburgh, N. Y.	80,000 "
D., L. & W. R. R.	Scranton, Pa.	100,000 "
Susquehanna Coal Co.	McClellan, Pa.	210,000 "
N. Y., O. & W. R. R.	Middletown, N. Y.	120,000 "
N. Y. Edison Co.	Shady Side, N. J.	100,000 "

2,360,000 tons



GENERAL VIEW OF SECOND SOUTH AMBOY, N. J., COAL STORAGE PLANT
(Dodge System—Patented)

Capacity, 90,000 tons. Erected in 1892 for Pennsylvania R. Co. as an extension of the 100,000 ton plant erected in 1889

Among the larger Plants built by The Dodge Coal Storage Company, and equipped with our machinery, for

STORING BITUMINOUS COAL

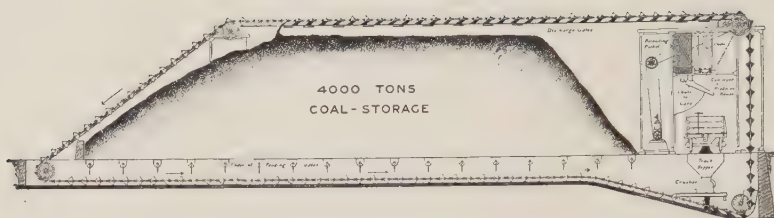
are the following :

N. Y. Edison Co.	Shady Side, N. J.	50,000 tons
N. Y. C. & H. R. R. R. Co.	Dewitt, N. Y.	50,000 "
Maryland Steel Co.	Sparrow's Point, Md.	50,000 "
Riverside Iron Works	Wheeling, W. Va.	4,000 "
Pennsylvania Steel Co.	Lebanon, Pa.	50,000 "
Lackawanna Steel Co.	Buffalo, N. Y.	40,000 "
Lackawanna Iron & Steel Co.	Lebanon, Pa.	40,000 "
United Coke & Gas Co.	Camden, N. J.	10,000 "
United Gas Improvement Co.	Philadelphia, Pa.	10,000 "
Sharon Steel Co.	Sharon, Pa.	40,000 "
Boston Elevated Railway Co.	Charlestown, Mass.	3,000 "
		347,000 tons



BITUMINOUS COAL STORAGE PLANT
Maryland Steel Company, Sparrow's Point, Md.

The Bridge (280 foot span) is pivoted at the right hand end and carries a 2-ton bucket operated by electric hoist. Coal is taken from cars to storage and from storage ground to a Conveyor System at the rate of 100 tons per hour. Storage capacity is 50,000 tons in a semi-circle.



BITUMINOUS COAL STORAGE PLANT

Riverside Iron Works, Wheeling, W. Va.

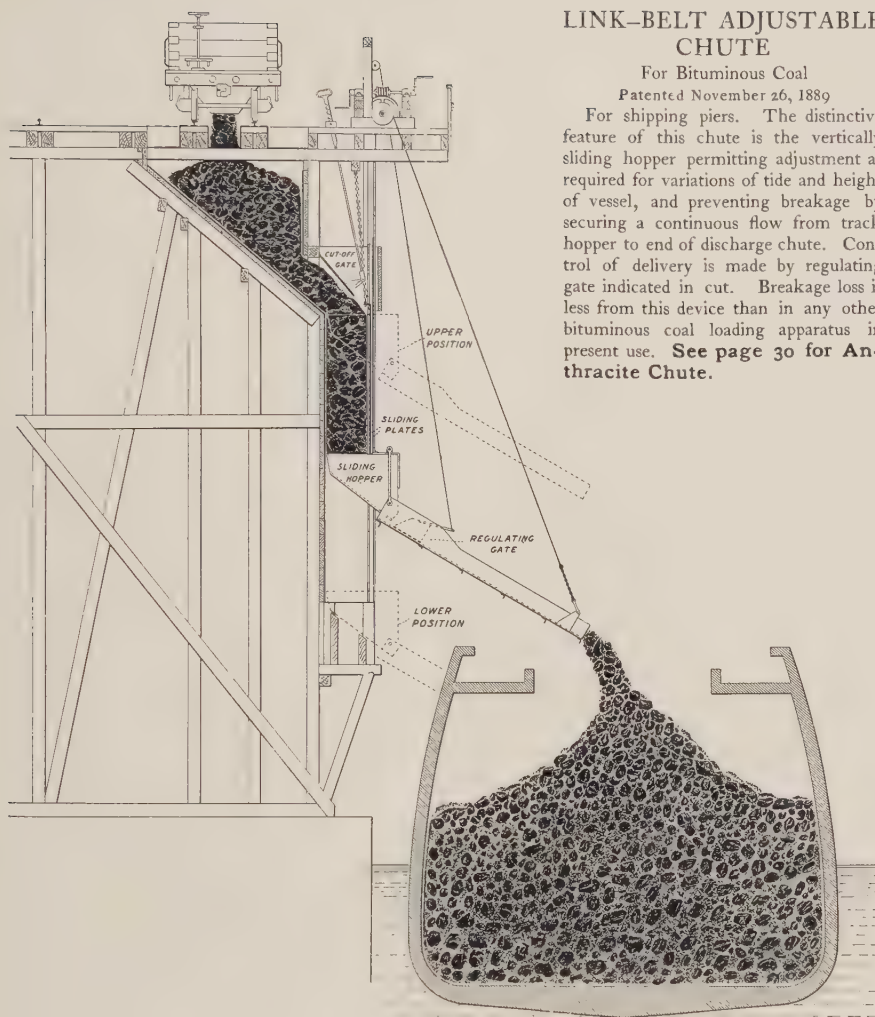
Coal received from railroad cars is crushed and elevated at the far end of plant and discharged through gates in trough above. Gates in roof of underground tunnel admit the coal to lower run of the combined elevator and conveyor, which effects delivery to cars or to another conveyor by which the coal is carried to retort house. Storage capacity 4,000 tons.

LINK-BELT ADJUSTABLE CHUTE

For Bituminous Coal

Patented November 26, 1889

For shipping piers. The distinctive feature of this chute is the vertically sliding hopper permitting adjustment as required for variations of tide and height of vessel, and preventing breakage by securing a continuous flow from track hopper to end of discharge chute. Control of delivery is made by regulating gate indicated in cut. Breakage loss is less from this device than in any other bituminous coal loading apparatus in present use. See page 30 for Anthracite Chute.



IN USE AT :

Pennsylvania R. R. Co., Greenwich Point, Phila.
Baltimore & Ohio R. R. Co., Curtis Bay, Maryland,
Louisville & Nashville R. R. Co., Pensacola, Florida.
Western Maryland Tide Water R. R. Co., Baltimore, Maryland.

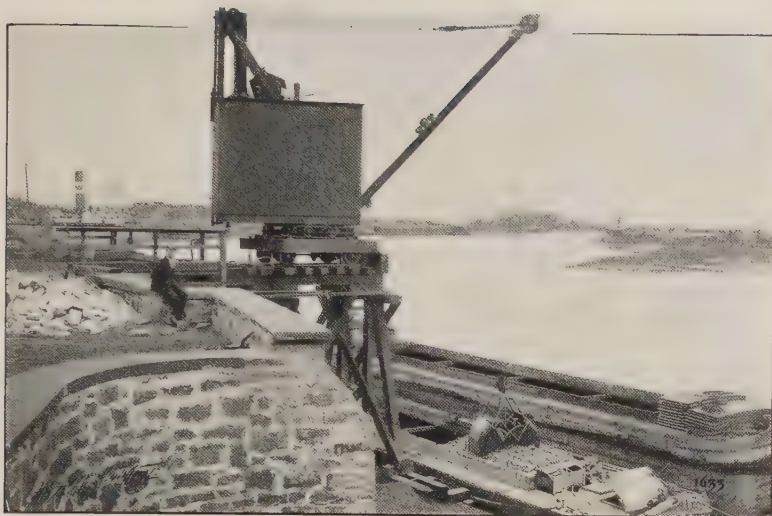


THE LINK-BELT ADJUSTABLE CHUTE—For Anthracite Coal

Patented November 26, 1889; April 1, 1890

This chute reduces to a minimum the breakage of coal in loading vessels. It is composed of a vertical box or hopper, through which the coal slowly descends, with a series of doors in its outer face, any one of which may be opened inward to form a bottom for the hopper, and a delivery chute suspended in front of this hopper by suitable tackle. This delivery chute is adjustable for height at both ends and may be set to receive from any one of the hopper doors and deliver to vessel at any stage of tide. The photograph is from the Port Richmond wharves of the Philadelphia & Reading Railway Co. See page 29 for Bituminous Chute.

IN USE AT: Philadelphia & Reading Railway Co., Port Richmond, Phila.; Philadelphia & Reading Railway Co., Port Reading, N. J.; Central Railroad of New Jersey, Port Johnson, N. J.; L. G. Burnham & Co., Boston, Mass.



STEAM LOCOMOTIVE REVOLVING CRANE

Equipped with self-filling bucket. In service of the United Gas Improvement Co.,
Point Breeze, Philadelphia, Pa.



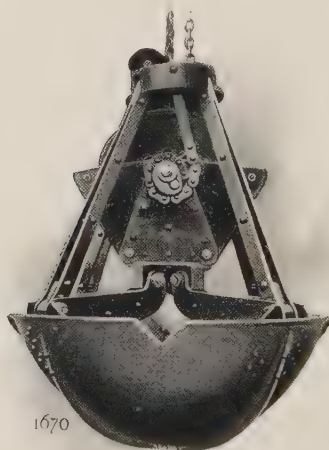
STEEPLE TOWER COAL HOIST

Furnished Brooklyn Heights Railway Company, Third Ave. Power House, Brooklyn, N. Y.

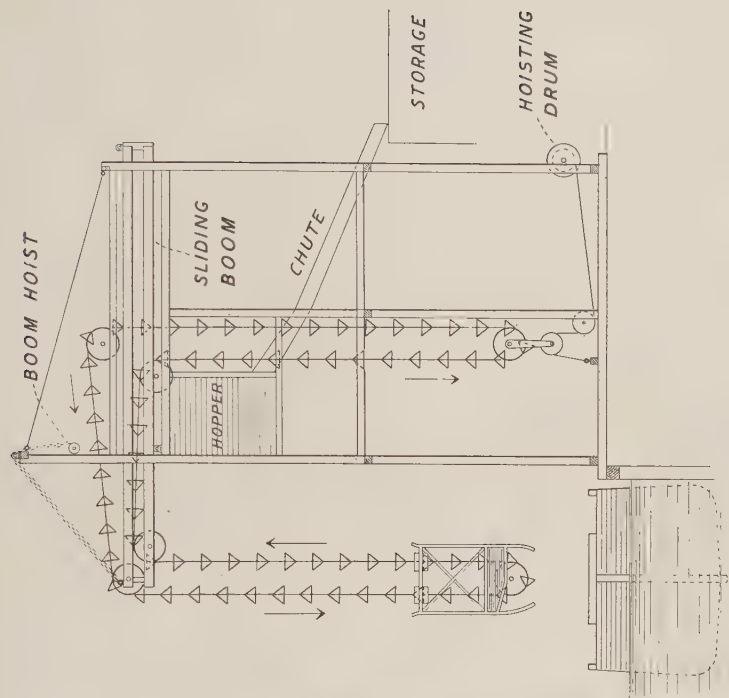
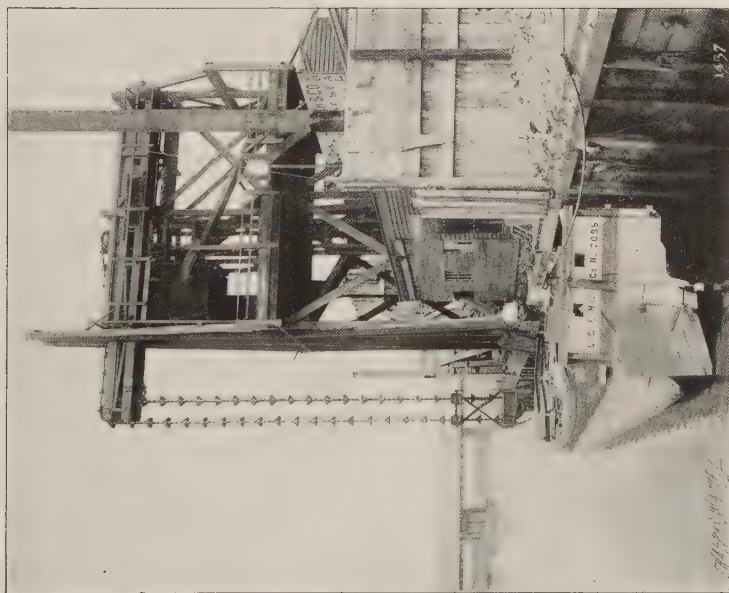
Equipped with self-filling grab bucket of $1\frac{1}{2}$ tons capacity. Takes coal from vessels,
crushes same, and delivers it to conveyors which feed coal bunkers in Power House. Capacity,
150 tons per hour and upwards.



CLAM SHELL SELF-FILLING BUCKETS
Made in sizes to handle from one to five cubic yards



ORANGE PEEL SELF-FILLING BUCKETS
Made in sizes to handle from one-half to five cubic yards



RAY DOCK LEG ELEVATOR

Patented

At coal yard of John C. Hancock & Co., Schuylkill River, Philadelphia, Pa.

This dock leg elevator is of the gravity bucket type and suspended from an adjustable boom. The boot is hung in the loops of the elevator chains, securing thereby a flexible connection with the boom and avoiding any strains which would result from the moving or shifting of the vessel through waves or wash from other boats. The leg is vertically adjustable to reach any depth of hatch or variation of tide, and when out of service the boom is moved back, bringing the leg out of reach of vessels. Elevates 40 tons per hour. We build this type of any desired capacity.



RAY DOCK LEG ELEVATOR

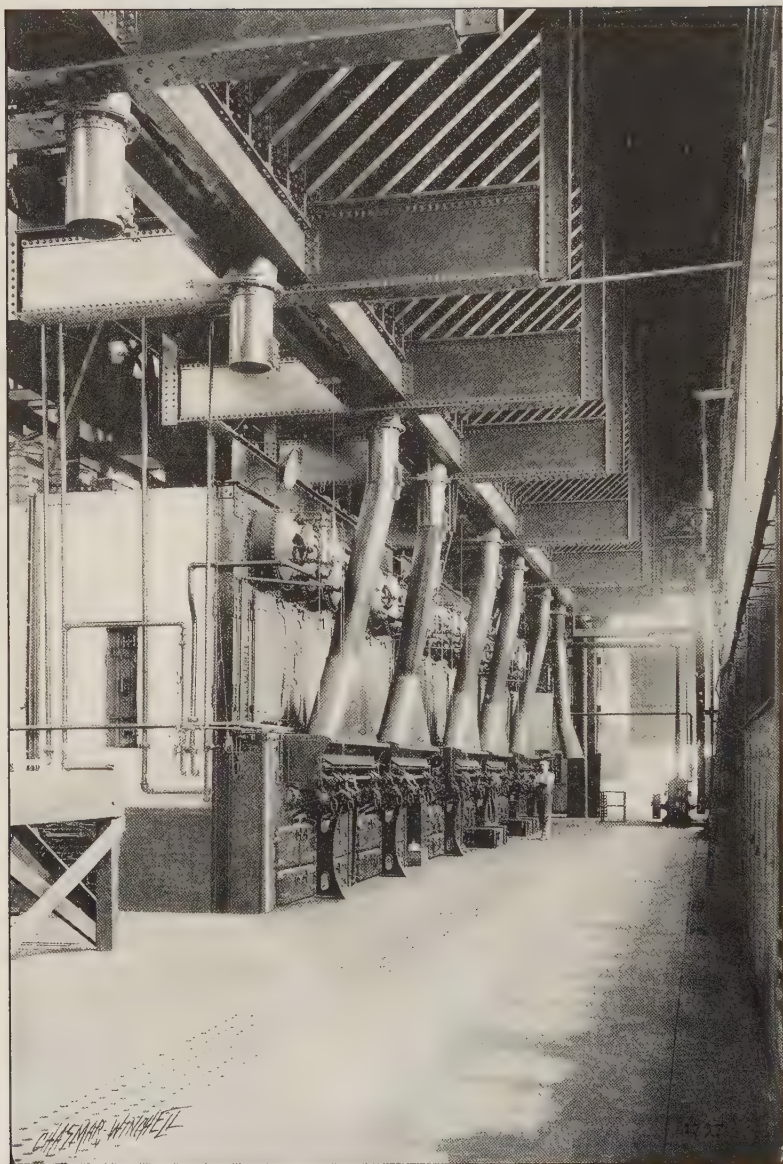
Patented

American Fisheries Co., Promised Land, Long Island, N. Y. Unloading fish from steamer
at rate of 120 tons per hour



CONTINUOUS BUCKET ELEVATOR

Carried by wrought steel truss. Installed for the Boston Elevated Railway Company, Charlestown, Mass. Machinery receives from Track Hopper, to which coal is delivered by one-ton Locomotive Crane, and discharges to Overhead Distributing Conveyors.



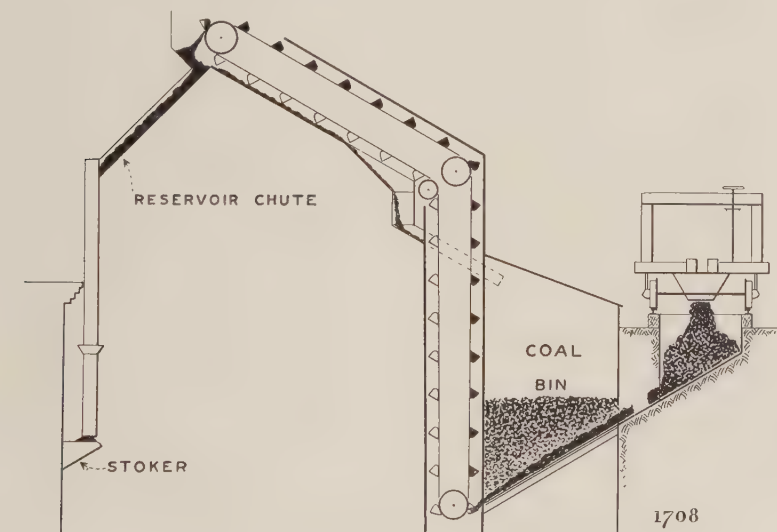
New boiler room No. 3, Midvale Steel Co., Philadelphia, Pa. Storage pocket of 600 tons capacity, suspended from roof trusses, is encircled by Link-Belt Carrier, discharging coal above and removing ashes from pit below.



BOILER ROOM IN BEACH STREET POWER HOUSE

Philadelphia Rapid Transit Company, Philadelphia, Pa.

Suspended steel coal hoppers with distributing conveyor and steel encased ashes elevator and conveyor. Part of complete coal and ashes handling plant.



CONTINUOUS RUNNING COAL ELEVATOR

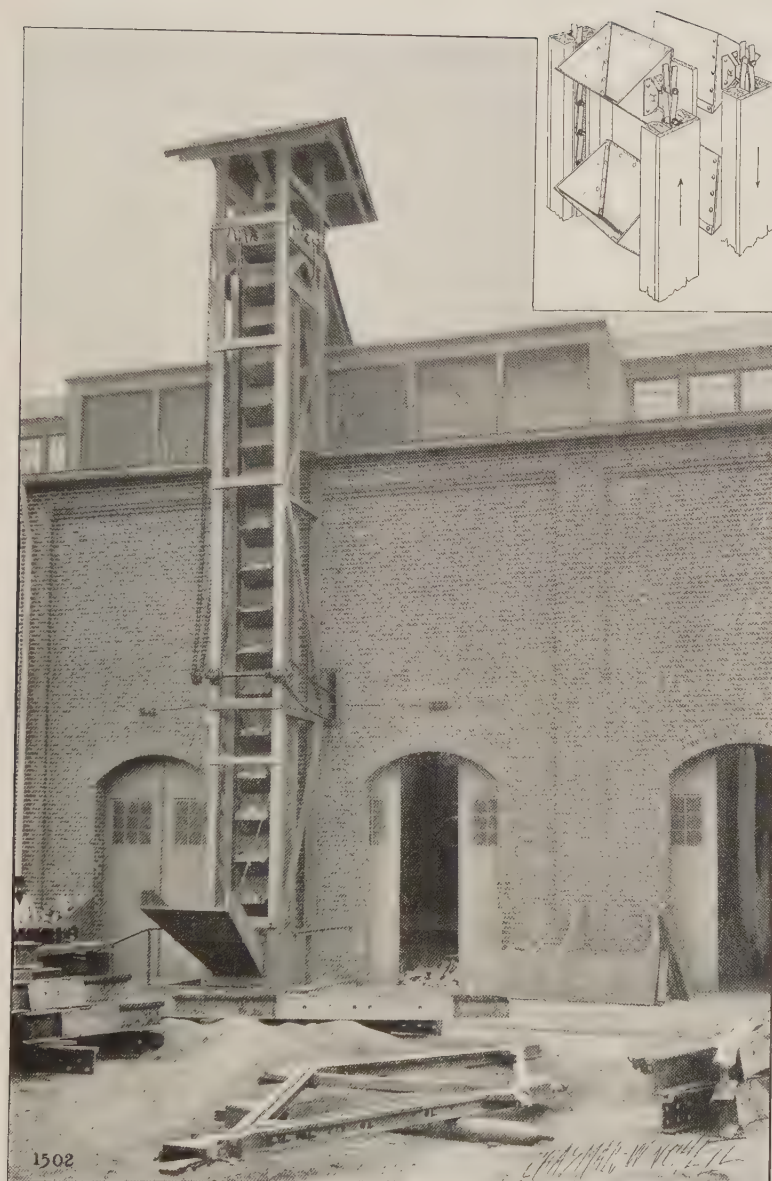
Erected for Joseph Bancroft & Sons, Wilmington, Del.

Coal dumped from cars flows to bucket elevator, which makes delivery to reservoir chute feeding two automatic stokers. Elevator runs continuously, at very slow speed, feeds itself automatically, and when coal is not consumed as fast as delivered to chute it flows down the underside of inclined part of elevator back to coal bin.



COAL ELEVATED AND CONVEYED WITHOUT TRANSFER

from track hopper to lantern of building. Saves expensive supports at the head and avoids long chute. View shows machine installed for the Solvay Process Co., Syracuse, N. Y.



FOUNDRY COKE ELEVATOR
At works of Wm. Wharton, Jr., & Co., Philadelphia, Pa.



CONVEYOR IN COAL HANDLING PLANT

Henry Disston & Sons, Philadelphia, Pa.

Malleable iron, thickened edge flights; sliding lubricated return. Conveyor is noiseless in operation



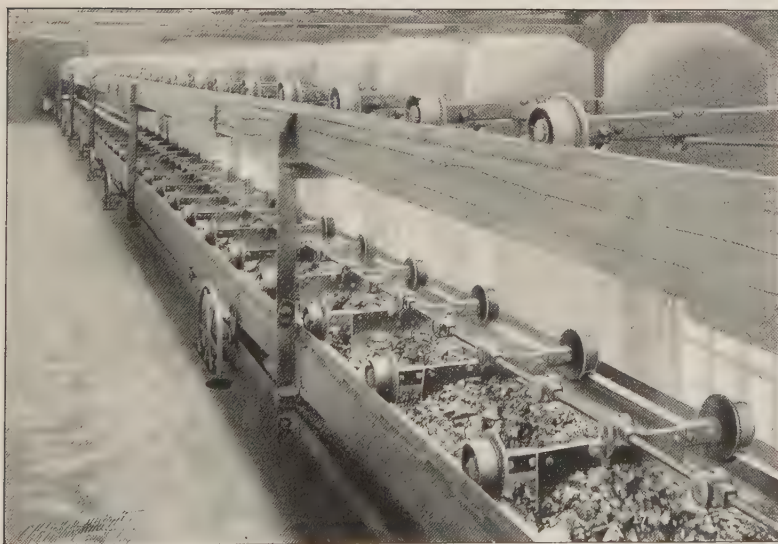
DISTRIBUTING CONVEYOR ABOVE COAL BIN

Pennsylvania Manufacturing, Light & Power Co., Tacony, Philadelphia, Pa.

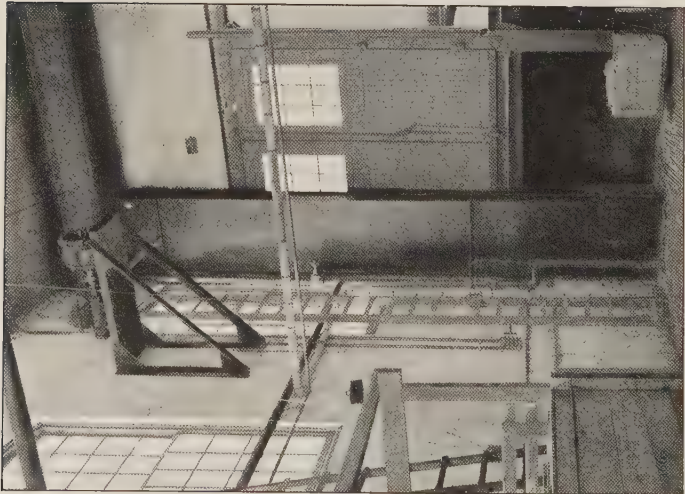
Suspended flights, noiseless. With proper lubrication, conveyor requires one-third less power than an ordinary scraping conveyor, with less wear on the trough and flights. It is driven by electric motor.



PLANT OF THE ALLEGHENY CITY WATER WORKS
Equipped with coal handling machinery



MONOBAR ROLLER FLIGHT CONVEYOR (MOTOR DRIVEN)
In boiler house of Allegheny City Water Works



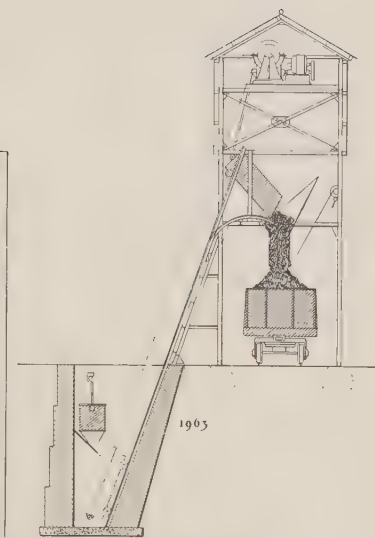
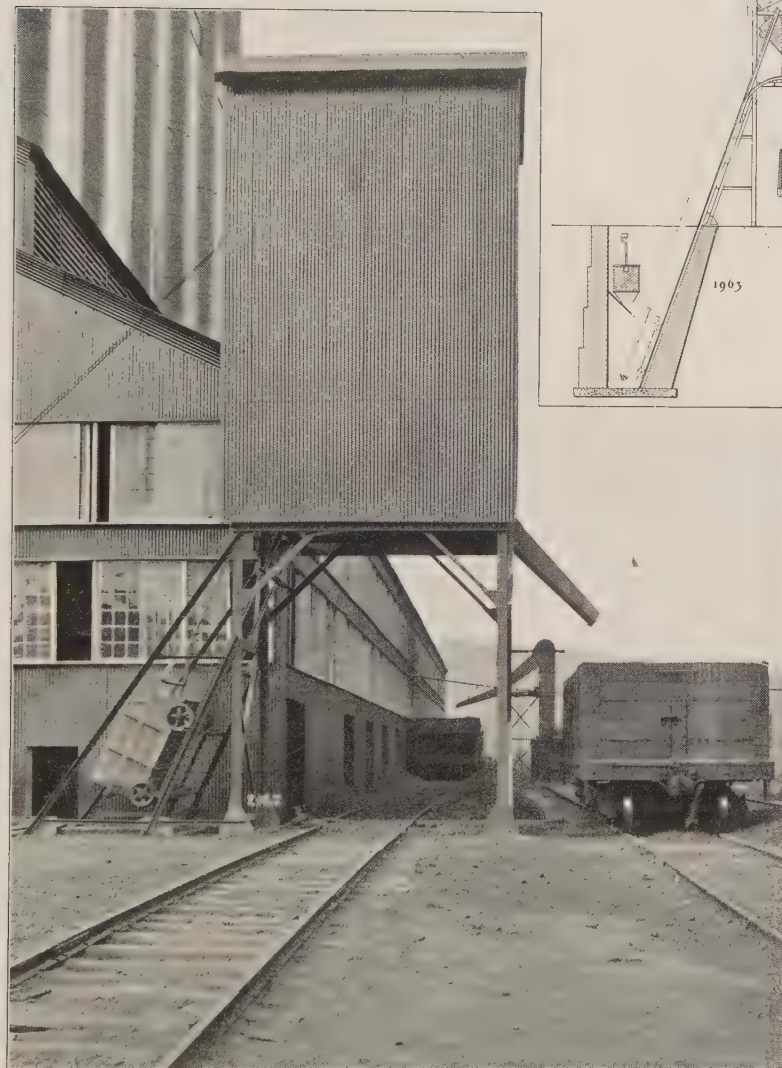
ASHES ELEVATOR

In boiler room of Philadelphia Tapestry Co. Dust tight, steel encased. Motor driven.



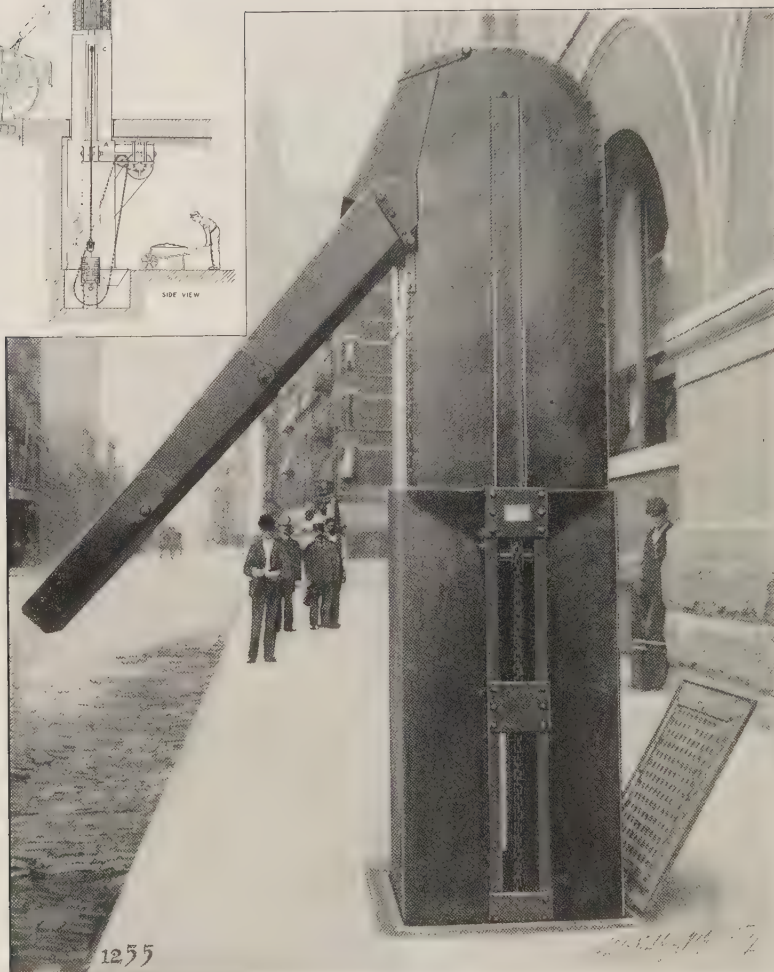
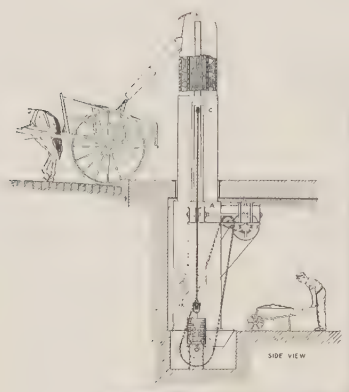
ASHES ELEVATOR

In power house of the Fairmount Park Transportation Co., Philadelphia, Pa. Handles an average of *four tons* of ashes per day. After four years in this hard service, the Ley bushed chain employed is in excellent condition. Wood casing.



SKIP HOIST

For handling ashes from boiler house to railroad cars. Installed for St. Clair Steel Company, Clairton, Pa. Similar Skip furnished Midvale Steel Company, Phila., Pa.



TELESCOPIC ASHES ELEVATOR

United States Appraisers' Warehouse, New York City

Ashes are elevated from boiler room in basement and delivered to carts, after which chute is folded up and elevator disappears through opening in sidewalk by telescoping upon itself. It handles ashes much more economically than can be done by the windlass and buckets commonly employed, and, by virtue of its capacity, obstructs the sidewalk for a materially shorter period of time.

These machines also in use at John Wanamaker's, Philadelphia; Public Building, Philadelphia; Siegel, Cooper & Co., Chicago; Chamber of Commerce Building, Chicago; Schiller Building, Chicago; Unity Building, Chicago; New Galt House, Louisville, Ky., and others

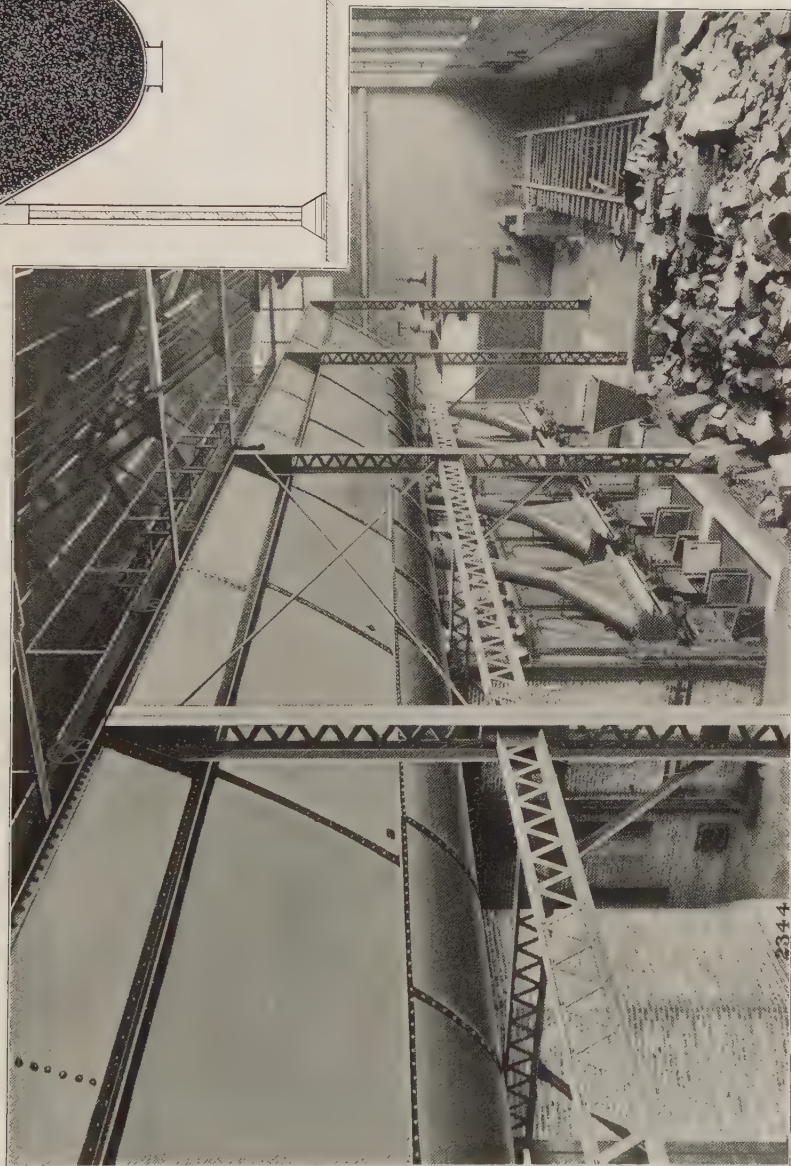


ASHES HOIST WITH TELESCOPIC FRAME
North American Building, Philadelphia, Pa.



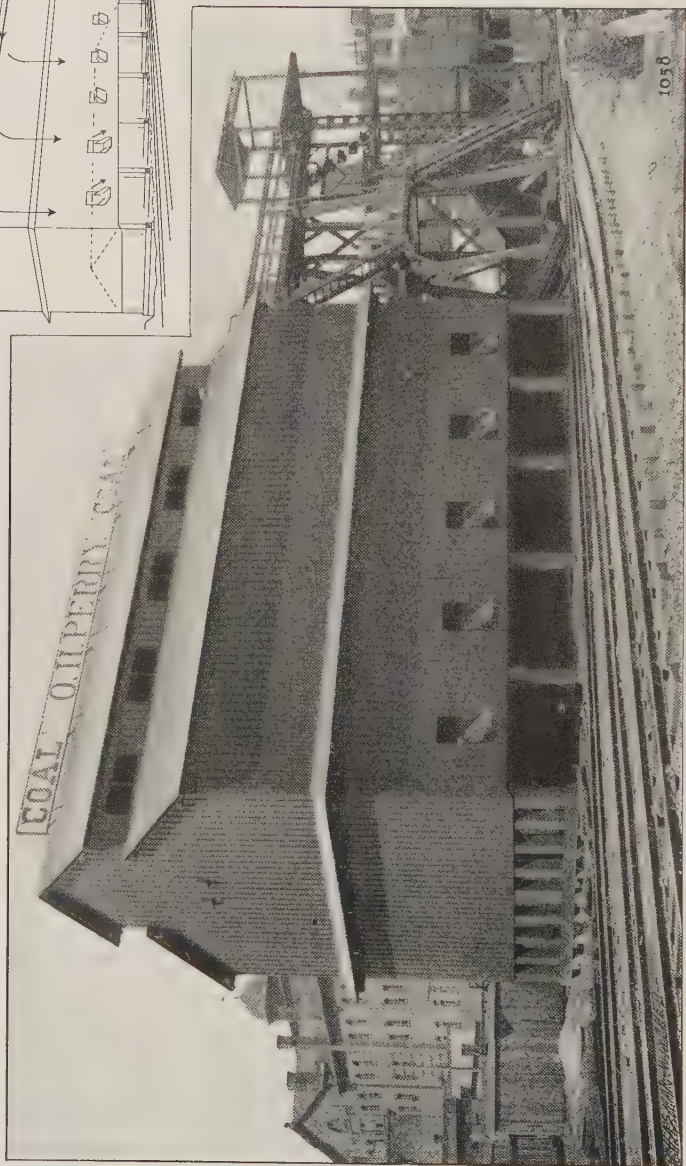
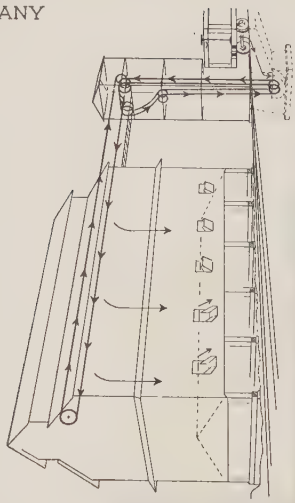
ASHES TANK

Capacity, 30 tons. Used in connection with Link-Belt Carrier System for handling coal and ashes in the new boiler house of the Midvale Steel Co., Philadelphia, Pa. Ashes are received by carrier from hoppers under boilers, elevated and delivered at a point on the upper run into a screw conveyor which takes them to the ashes tank.



350-TON BERQUIST SUSPENSION BUNKER
Patented

Part of equipment furnished 1903 for the Crucible Steel Company, Jersey City, N. J., for elevating, conveying, crushing and storing coal in boiler house. We are under license to build these bunkers, and construct them of any desired capacity.



A MODERN RETAIL COAL POCKET

Erected for Perry Coal Co., Jersey City, N. J., in 1896

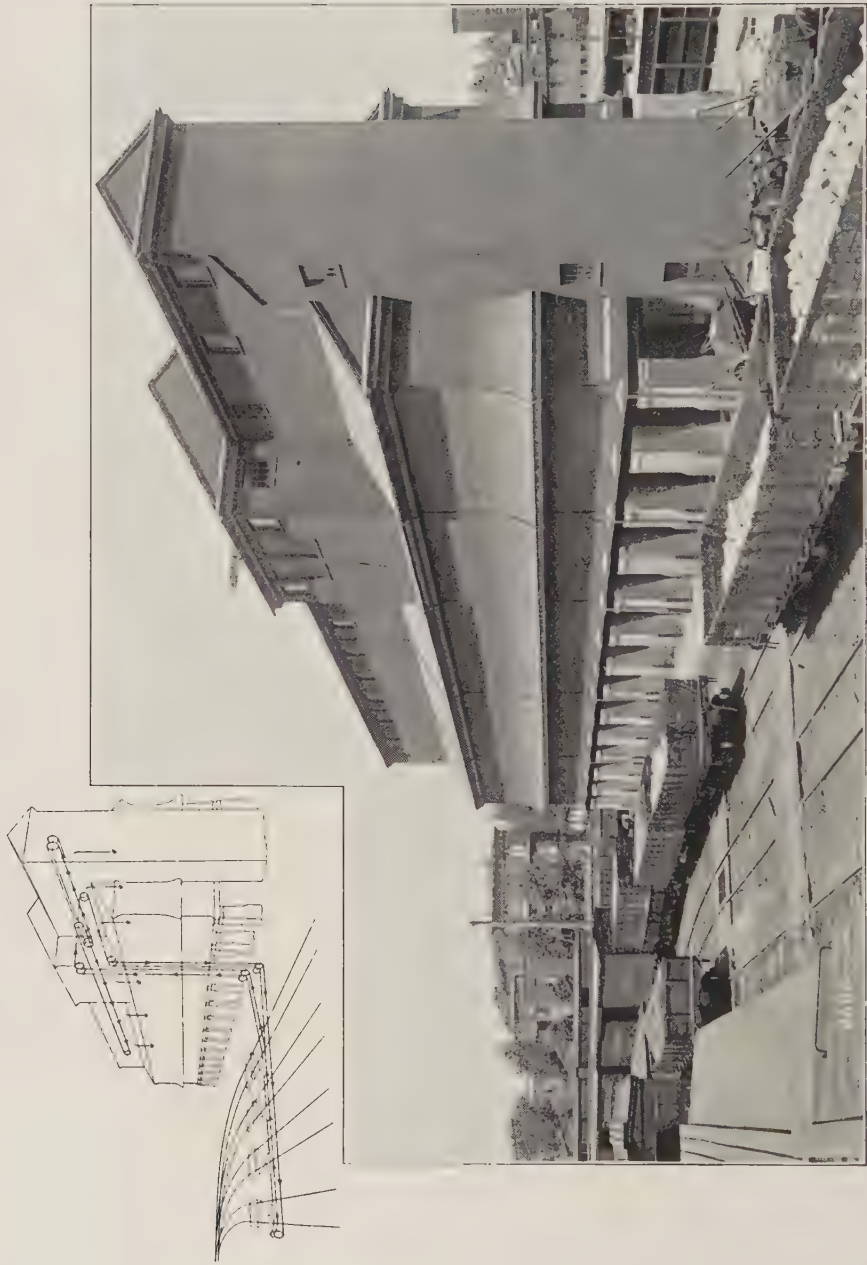
Coal is raised from track hopper by Gravity Discharge Elevator, which delivers to Monobar Conveyor for distribution through pocket.

Machinery is driven by electric motor and one man operates the whole.



LINK-BELT SCREENING CHUTES

At retail coal pocket of Jagels Bros., Hoboken, N. J. Elevating and conveying machinery similar to that installed for Perry Coal Co. (see opposite page), is also a part of the equipment of this plant.



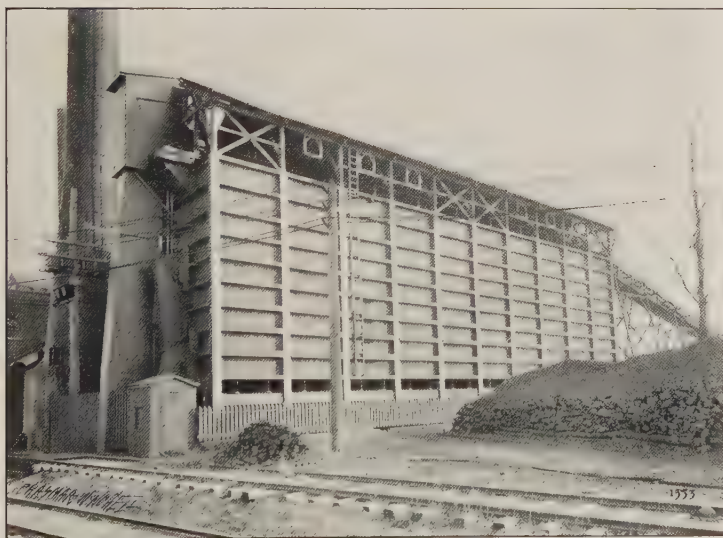
3000-TON WHOLESALE COAL STORAGE POCKET

Designed and equipped for the Baltimore Storage & Distributing Company, Baltimore, Maryland
Coal is received from four Track Hoppers. Gravity Discharge elevator, employing No. 1170 Roller Chain, delivers the coal to two Over-
head Monobar Conveyors. Operated by electric motor and manila rope transmission.



MAST AND GAFF OF TUB HOIST, WITH PORTION OF INCLINED
CONVEYOR LEADING FROM DOCK

Pennsylvania Manufacturing, Light & Power Co., Tacony, Philadelphia, Pa.

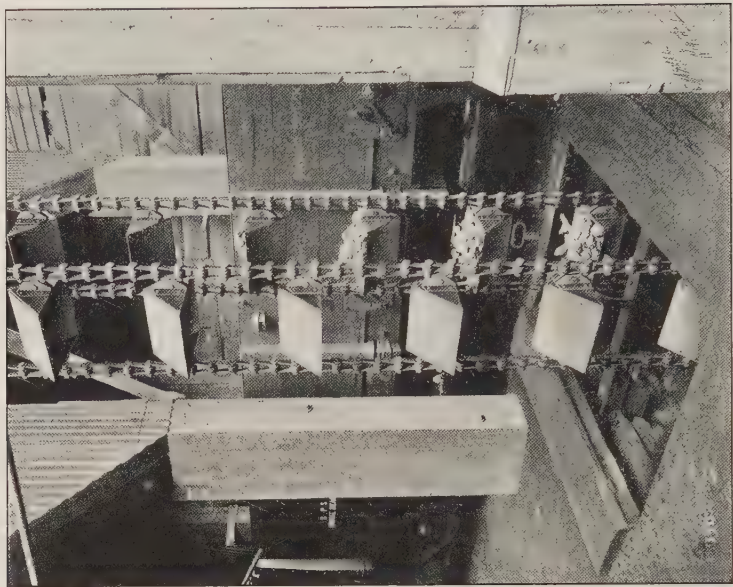


STORAGE POCKET

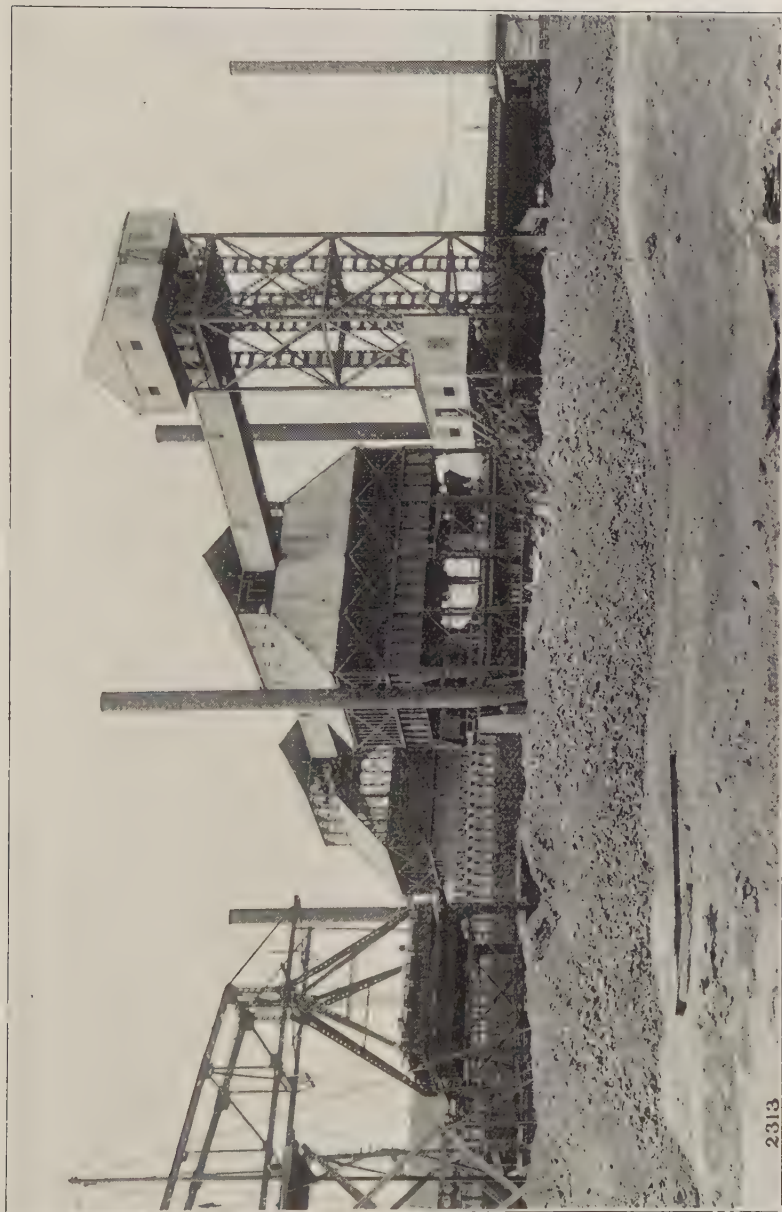
Pennsylvania Manufacturing, Light & Power Co., Tacony, Philadelphia, Pa.



Shows delivery from Gravity Discharge Elevator to Monobar
Conveyor



Section of Gravity Discharge Elevator employed in retail coal pocket of
Richard McAllister, 1320 North Second Street, Philadelphia, Pa.

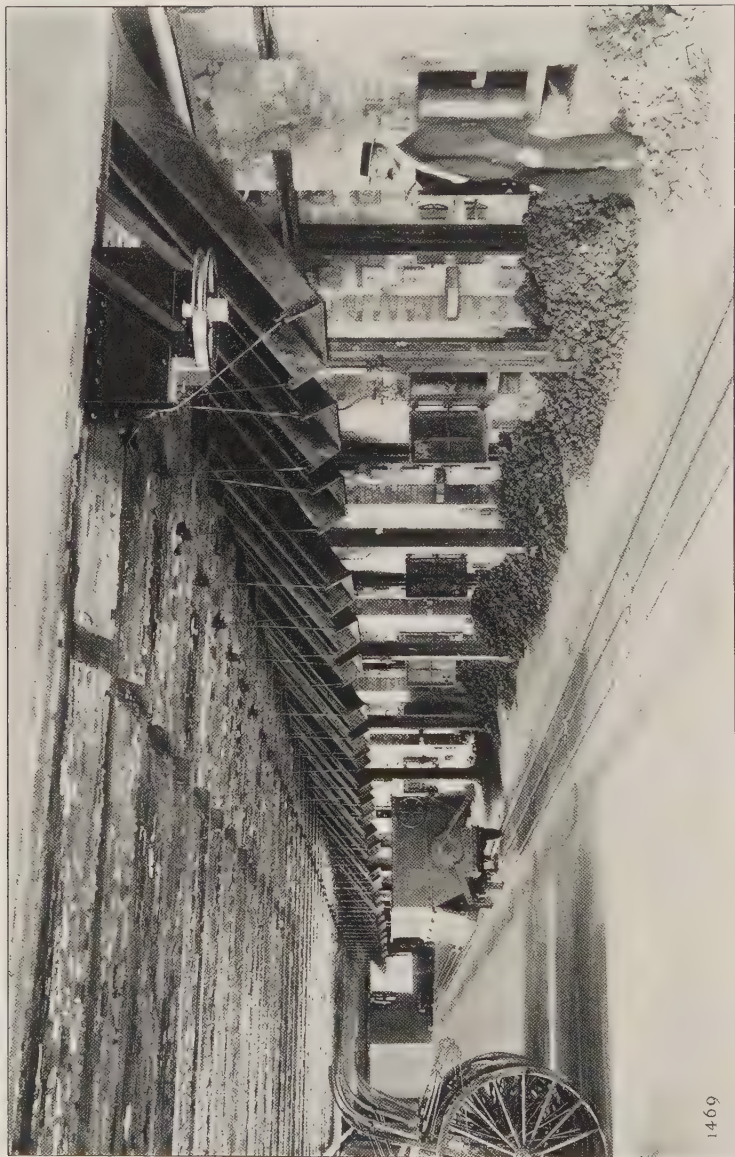


2313

GENERAL VIEW OF 200 COKE OVEN PLANT, MARYLAND STEEL COMPANY

Sparrow's Point, Maryland

Equipped with Circular Storage System having a capacity of 50,000 tons, which operates in conjunction with a crushing, elevating and conveying system, handling 1,600 tons of coal in ten hours.



COKE HAUL—25th Ward Works, United Gas Improvement Co., Philadelphia, Pa.
Car receives retort coke from overhead chutes and is drawn by wire cable through house and to trestle shown in view No. 1495 (on opposite page), where it is dumped. Entire equipment of coke handling machinery designed and furnished by THE LINK-BELT ENGINEERING COMPANY.



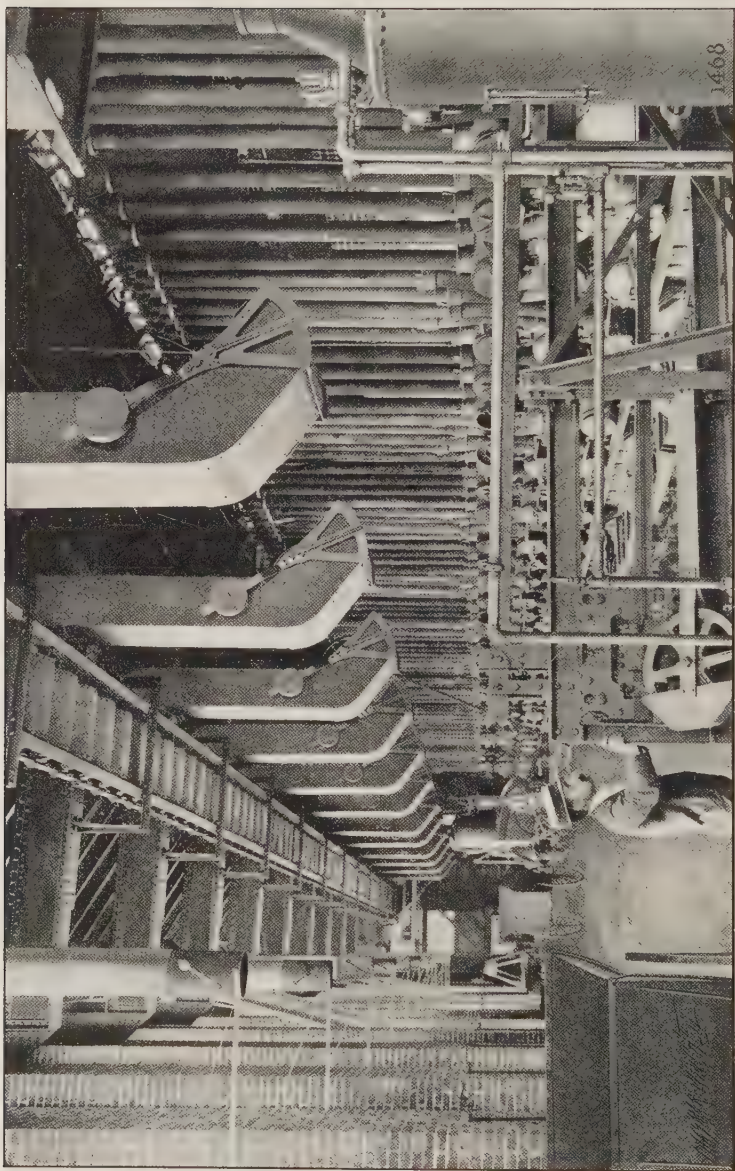
TRESTLE AND LINK-BELT SIDE DUMPING CAR

Part of coke handling and storage system at retort house of the United Gas Improvement Co.,
25th Ward Works, Philadelphia, Pa.

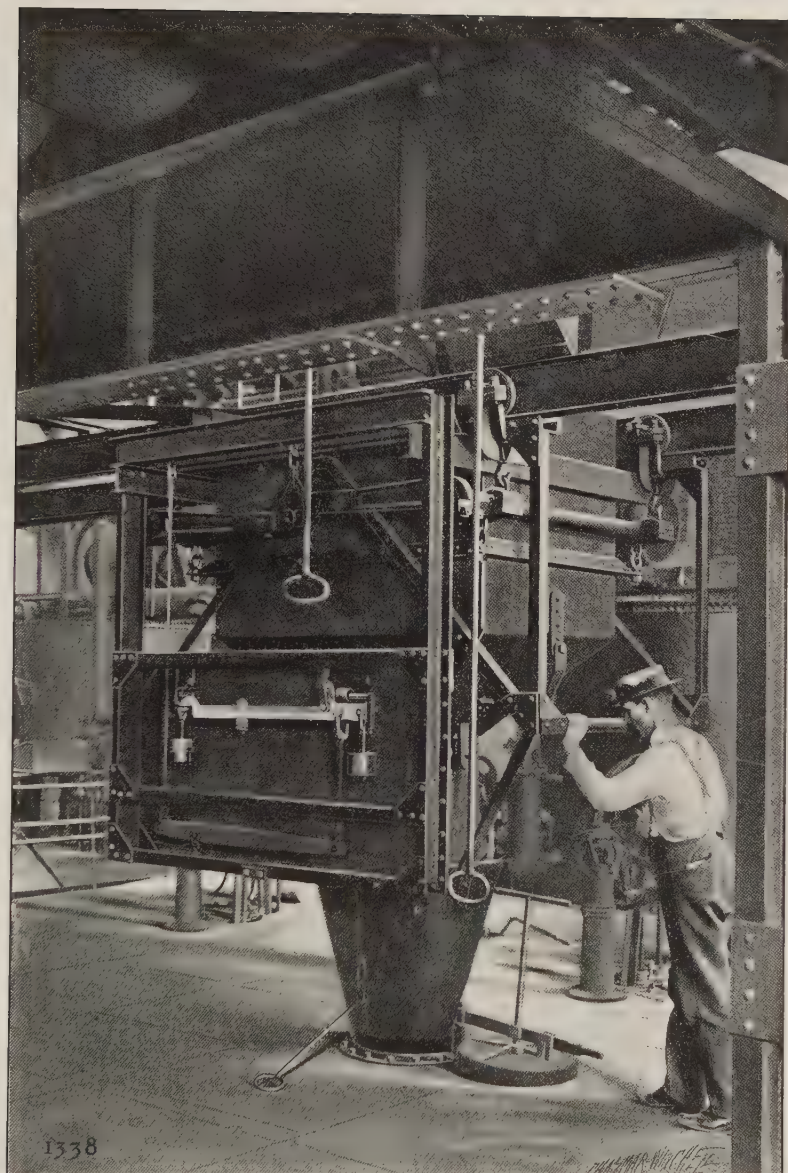


OPEN TOP LINK-BELT CARRIER

At United Gas Improvement Co.'s Point Breeze Works, Philadelphia, Pa.
Passes through basement of retort house and receives coke from buggies, delivering it to coke
storage pile shown



A series of chutes, equipped with Link-Belt Undercut Gates, delivering coal from overhead hopper to automatic stoking machines in retort house of the United Gas Improvement Co., 25th Ward Works, Philadelphia, Pa. Illustration also shows, under the storage bin, return run of Link-Belt Carrier which distributes coal overhead into the bin.



COAL-WEIGHING HOPPER

At Point Breeze Works, United Gas Improvement Co., Philadelphia, Pa.
Equipped with ball-bearing wheels. Link-Belt Carrier employed for delivering coal to
overhead hopper.

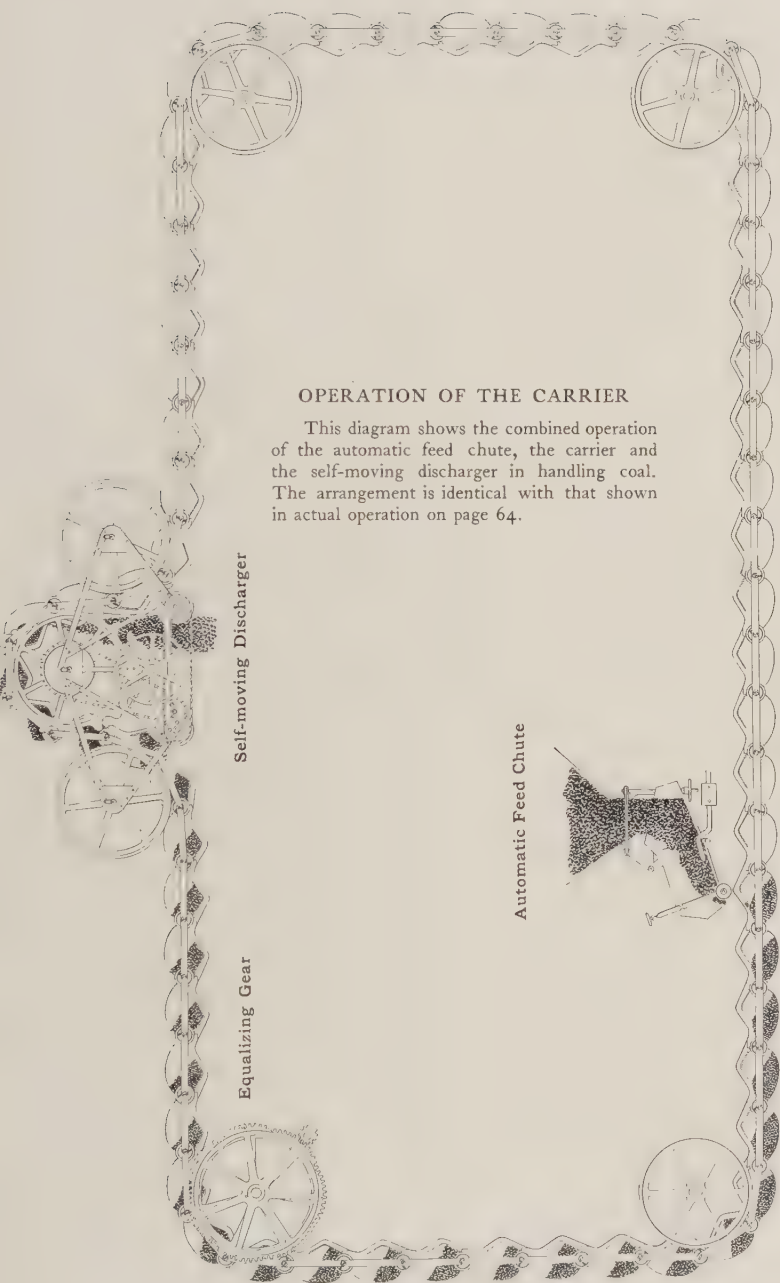


COMPLETE COAL HANDLING PLANT

At 25th Ward Works, United Gas Improvement Co., Philadelphia, Pa.
Coal passes from track hopper to apron feeder, which affords uniform and continuous delivery to crushing rolls under floor. Coal passes from rolls to Link-Belt Carrier, which delivers it to retort house across the street.

OPERATION OF THE CARRIER

This diagram shows the combined operation of the automatic feed chute, the carrier and the self-moving discharger in handling coal. The arrangement is identical with that shown in actual operation on page 64.



Carriers

The Link-Belt Carrier

Patented August 4, 1896

A mechanical coal carrier is an essential part of a modern steam plant.

The Link-Belt Carrier meets the demand simply and directly. It is a radical departure from the types of machine previously employed or designed for coal carrying. It infringes no patents, but is fully protected under its own.

The Link-Belt Carrier is an endless series of buckets, or hoppers, successively hinged together and rigidly secured to their connecting links.

In its simplest form the carrier is a straight line conveyor with sprocket wheels at its two ends, receiving its load at any point in its length, and delivering as it passes over the terminal sprocket wheel. In this form it is used either horizontally or at any desired inclination. As an elevator or vertical carrier it is equally serviceable, a short portion of the carrier at the foot being run horizontally to permit feeding through a regulating chute. This arrangement does away with the iron boot usually employed at the foot of vertical elevators, and gives a clean delivery overhead at any speed.

As a combined conveyor and elevator the Link-Belt Carrier finds its widest range of efficiency and economy. It will carry around three sides of a vertical square without dumping any of its load, or will, through the intervention of the self-moving discharger, deliver the coal at any point on the third side.

The features of construction and operation which make the Link-Belt Carrier an unequaled machine for handling coal and other friable materials which must not be broken or crushed, make it also the ideal carrier for macadam and other broken stone and phosphate rock, which must not be allowed to destroy the machinery employed to handle them.

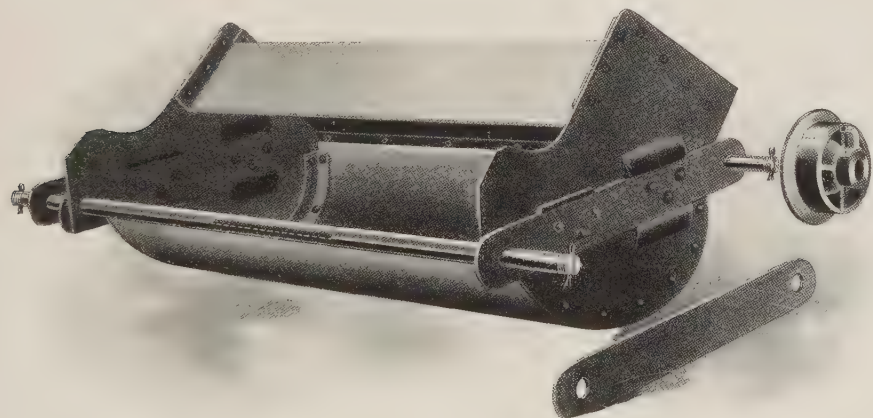
Brief descriptions of the details and separate patented inventions entering into the construction of the Carrier follow.

The Bucket

Patented August 4, 1896

as made for a carrier which discharges at more than one point, is shown in the accompanying illustration. It is of plate steel, machine riveted, reinforced by angle irons and stiffened by the flange top or roof. All parts of this bucket are drop forged and punched by templet. This insures uniformity and saves labor in assembling.

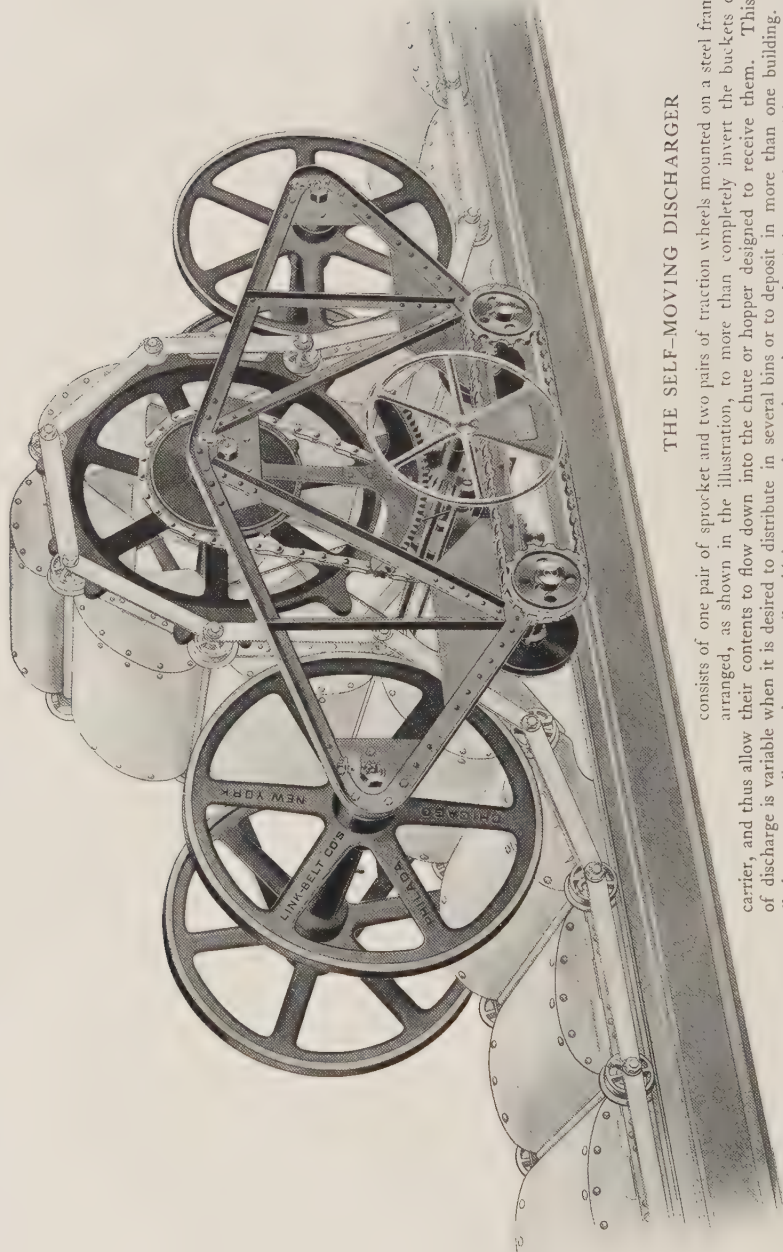
The ends of the buckets are stamped as shown, the projecting ridges serving to confine the chain link and relieve the rivets of shearing strain. The front edge of the body of the bucket is curved over the shaft which carries the self-oiling flanged rollers and the chain links, forming a projected



THE BUCKET

hinge connection between each bucket and the following one. This joint prevents any leaking of dust or other material between the buckets.

The contour of the bucket ends is curved to guide and operate the automatic feeding device frequently used in connection with the carrier. Modified forms of the carrier bucket are designed and employed to handle various materials under varying conditions. If delivery at only one fixed point is required, open buckets can frequently be used, the top being dispensed with; but in all forms and under all conditions the protected hinge joint is maintained as an essential feature.

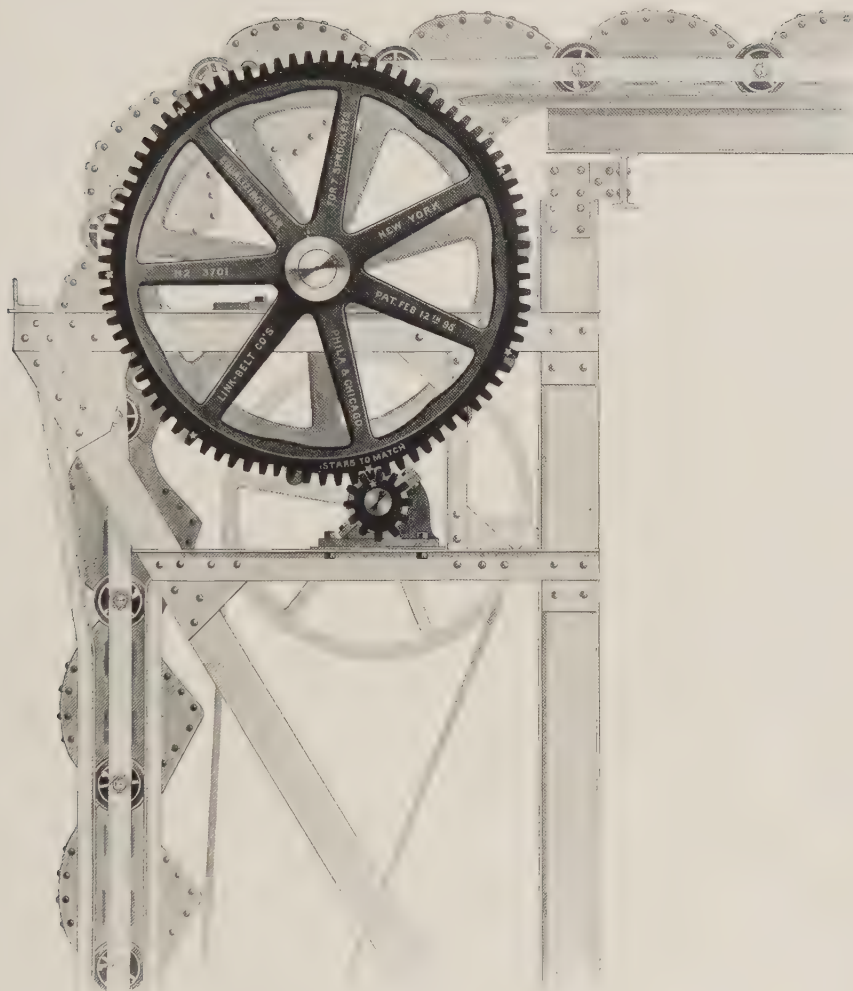


THE SELF-MOVING DISCHARGER

consists of one pair of sprocket and two pairs of traction wheels mounted on a steel frame and arranged, as shown in the illustration, to more than completely invert the buckets of the carrier, and thus allow their contents to flow down into the chute or hopper designed to receive them. This point of discharge is variable when it is desired to distribute in several bins or to deposit in more than one building. The discharger, traveling on the same rails which support the carrier, changes the delivery point quickly and as often as desired. It is controlled by the hand wheel shown in the cut. A half turn of this wheel to the right locks the carriage to the carrier chain, causing it to travel with the chain of buckets till the hand wheel is released, when it instantly stops. A half turn of the wheel to the left engages the reversing gear and starts the discharger backward, or against the travel of the carrier, till the desired point for discharging is reached. The mechanism is strong, accurate and not liable to derangement.

Driving Gear

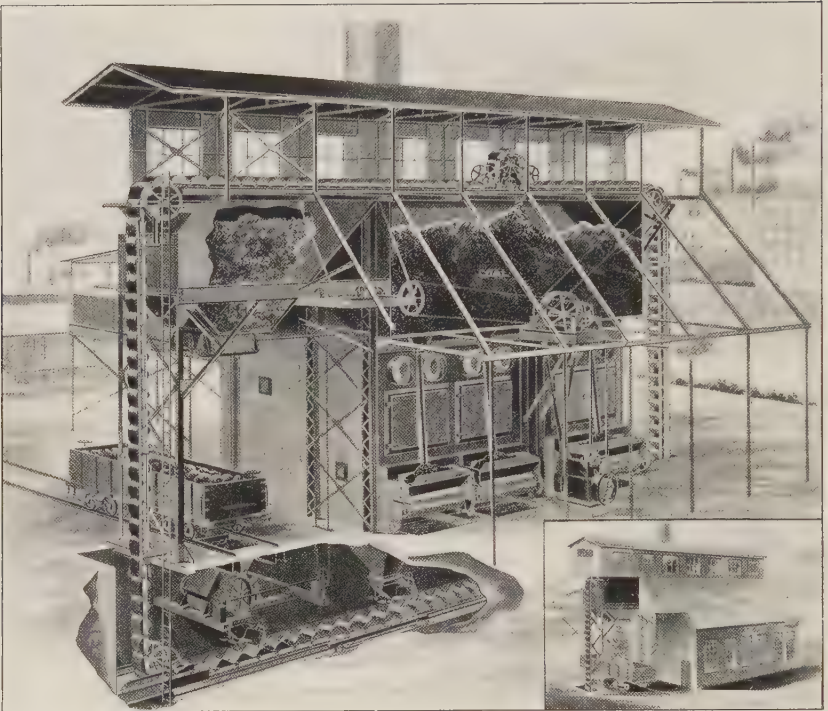
Patented February 12, 1895



THE EQUALIZING GEAR

The equalizing gears described on page 173, and used in imparting motion to all our long-pitched chains, are peculiarly adapted to driving the carrier, as its pitch is never less than 12 inches and usually more.

We make this gearing a part of every Link-Belt Carrier.



THE LINK-BELT CARRIER IN BOILER HOUSE

At iron works of Messrs. A. & P. Roberts Co., Pencoyd, Pa.

Bituminous coal, after passing through crusher and automatic feed chute, is carried to the right about 50 feet, elevated about 35 feet and distributed by the self-moving discharger in the coal bin, from which it is delivered by gravity to the stokers.

Ashes from the pits are fed to the carrier by other automatic chutes, and pass over the coal hopper to the ash bin on the left, into which they are dumped by the discharger, which has been run to the proper point.

The carrier is about 200 feet long, and runs at a speed of 60 feet per minute. Buckets are 18 x 18 inches.

The Link-Belt Self-oiling Rollers

With the advance natural and incident to the development of mechanical transfer of materials a demand was developed, after the primary problems had been solved, for refinement of details, reduction of needed power and consequent economy of operation. Naturally, small wheels came into general use for carrying the conveyor, whether of the scraper or bucket type, and in the earlier installations the lubrication of these rollers was accomplished by simply doping the moving parts and letting this suffice. It is needless to say that the wear of the rollers and their axles under these conditions gave disappointing results.

The next step was the chambering of the roller, filling the chamber with an absorbent material which was thoroughly saturated with oil and which could be recharged by removing a screw plug in the wheel, and squirting oil into the chamber. This was a great advance, and though it was in but rare instances that the wheels ever got their second supply of oil, the filling would carry them over at least a year's time with fair lubrication.

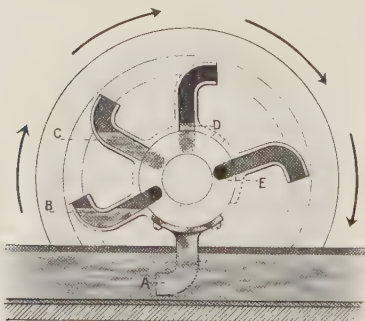
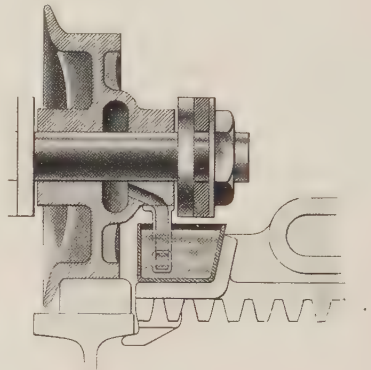
The Fingered Self-oiling Roller

Patented March 23, 1897



The next advance was made by the introduction of the Link-Belt Self-oiling Wheel with its finger oiler. This wheel was really the first entitled to the designation of "self-oiling," as the wheels literally did this work by dipping the hollow fingers

into a reservoir of oil and delivering the oil upon the axle journal, the only instance, as far as we know, where this has ever been accomplished. The record of these wheels fitted with oilers has been most satisfactory. Great numbers have been in use for the past three years, showing, upon inspection, no serious wear, both the axles and the bores of the wheels being in perfect condition. One dis-



advantage, however, was developed; namely, the tendency of the passages in the fingers to become clogged and consequently inoperative. If, however, these were cleaned out by running a wire through them, they would become perfectly operative again and the wheels be good for another long term of service.

The Absorbent Roller

Patented March 25, 1902

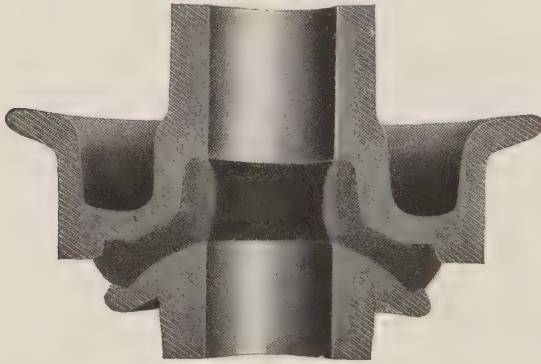
The solution of this problem has been fully and completely reached in the invention and introduction of the Link-Belt Absorbent Roller. In this device we have gone back to the primary idea of having saturated wicking or packing surround the axle in the hub of the wheel, but with this great improvement, instead of the packing being



1920

wholly confined in the wheel and being practically but once saturated with lubricant and forever afterward neglected, we, by bringing the packing out through the sides of the wheels, render it possible to renew the supply of oil at any time by simply saturating the exposed part of the packing. It is obvious that if a portion of the packing is soaked in oil there will be a gradual distribution through the mass, with a tendency to supply the portion next to the axle with oil to replace that which is used up in the journal.

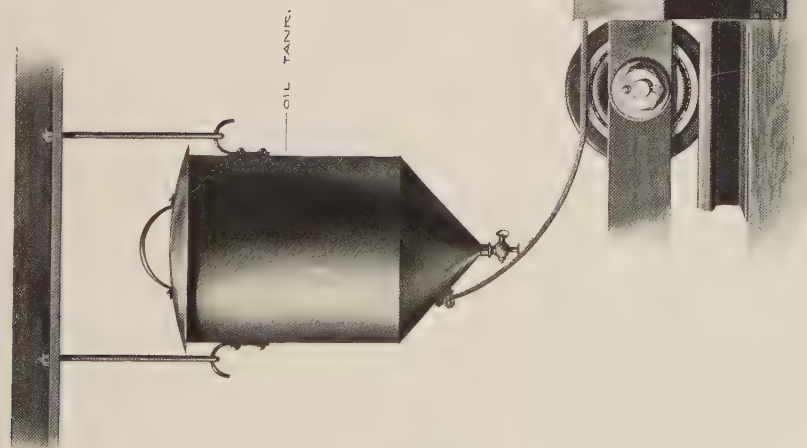
The device is so simple that its value is self-evident. A vital point of all wheeled conveyors of whatever type is the rapid wear of the journals and wheels ordinarily furnished. This wear causes serious and expensive delays and destroys the articulations of the conveyor, which are the vital parts. A mechanism supplied with absorbent rollers, even though, in general terms, of very faulty design, may be made more efficient, economical, durable and satisfactory than a perfectly designed apparatus not so equipped.



The field for the use of the absorbent roller principle is very large, and we are prepared to meet fully the requirements of such opportunities for its use as may be presented.

(See page 69 for illustration of method used for applying the oil to absorbent rollers.)

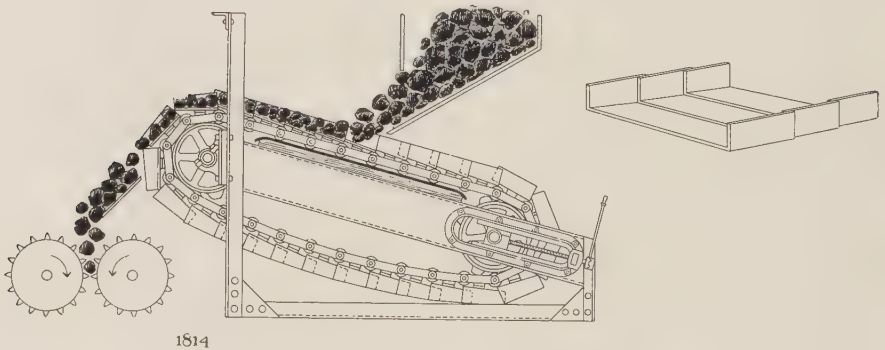
This cut shows a method of applying oil to absorbent rollers on horizontal runs. The *Rod* is hinged at one end and so guided at the other that it bears on the exposed surfaces of the felt. The oil is fed to the rod from the oil tank and wiped off by contact with the felt.



Our Continuous Apron Feeder

is to be employed when a steady, constant flow of material is required, as in making delivery from a hopper to a crusher.

This feeder is placed under the discharge opening of a hopper as shown in cut below, the speed of the apron controlling the rate of delivery.



CONTINUOUS APRON FEEDER

Run-of-mine bituminous and lump anthracite coal are successfully fed to the rolls or crushers by this device. No crusher or rolls should be operated without it.

The apron feeder materially reduces the power required to operate the crusher by giving it uniform load, which prevents choking.

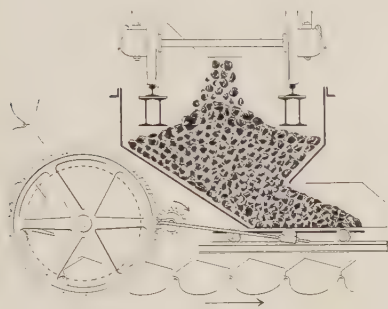
It dispenses with a man at the feeding gate.

The Link-Belt Reciprocating Feeder

Patented March 26, 1901

can be constructed of any size and capacity.

It controls the delivery of lump anthracite coal with masses thirty inches and larger in diameter as readily as it does the delivery of buckwheat coal. This is rendered possible by the fact that the rate of delivery is entirely independent of the size of the discharge opening in the hopper, and that the opening can therefore be made large enough to suit the lumps to be handled.

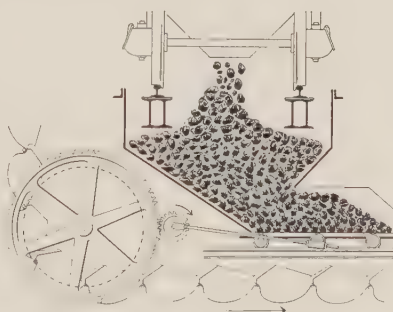


POSITION "A"

In its simplest form this gate consists of a flat metal apron operating under the discharge opening of a hopper and actuated by a crank mechanism connected with the conveyor.

The hopper is so constructed as to relieve the gate or feeder of the weight of the material the hopper contains.

The illustrations make the operation clear. View "A" shows the reciprocating feeder in its innermost position. It will be seen that the apron extends a trifle beyond the line of repose of the material, and that in this position it effectually checks any discharge from the hopper. As the crank shaft revolves, the apron is moved forward into position "B," the mass of material it supports is moved forward with the apron, and material from the hopper crowds down to fill the space made vacant. With the completion of the crank's revolution the apron is pulled

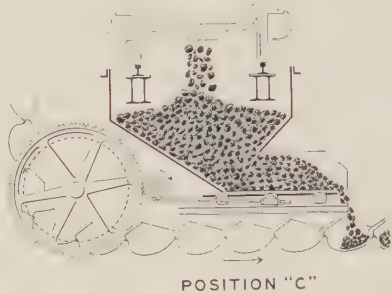


POSITION "B"

back to position "A," but the material it supports is prevented from moving back by the mass of material in the hopper ; a portion of it is therefore discharged over the end of the apron.

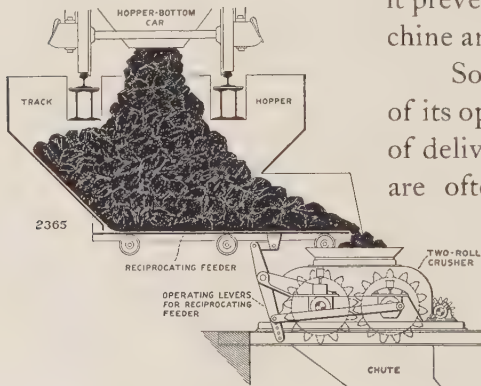
The amount of material so delivered depends upon the distance the apron moves. This can be varied by changing the throw of the crank, and it is therefore an easy matter to control the amount of material which shall be discharged into the conveyor.

The delivery of the reciprocating feeder being intermittent, it is especially useful in the delivery of materials to bucket or scraper conveyors, insuring each bucket or flight its proper load. The number of reciprocations in such cases is made to correspond with the number of buckets or the number of flights that are to be fed.



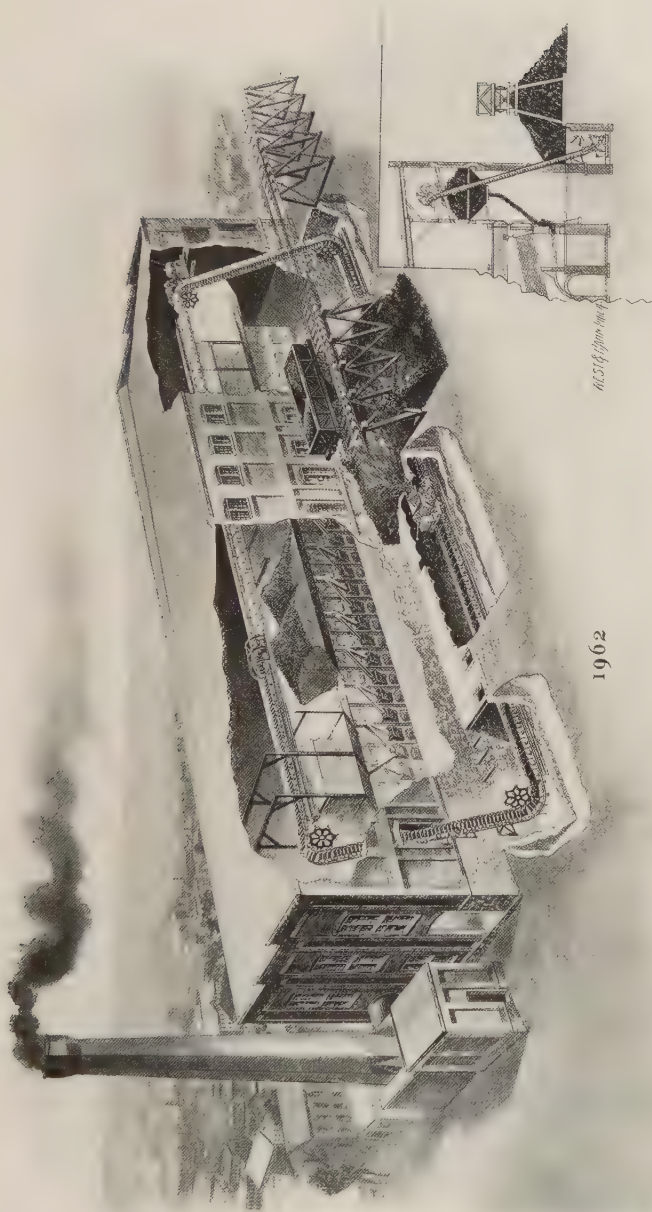
The Link-Belt Reciprocating Feeder performs its duty automatically. Besides dispensing with the labor of a man, it prevents overloading the machine and consequent dangers.

So perfect is the manner of its operation, and its control of delivery, that several chutes are often placed in position



over one conveyor and operated simultaneously, delivering quantities of different materials, or varying sizes of the same material, in the proper amount and proportion.

This reciprocating feeder has made possible the efficient handling of lump materials and at a substantial reduction in cost.



1902

LINK-BELT TRANSFER

Patented

No. 2 Boiler House, Solvay Process Co., Syracuse, N. Y.

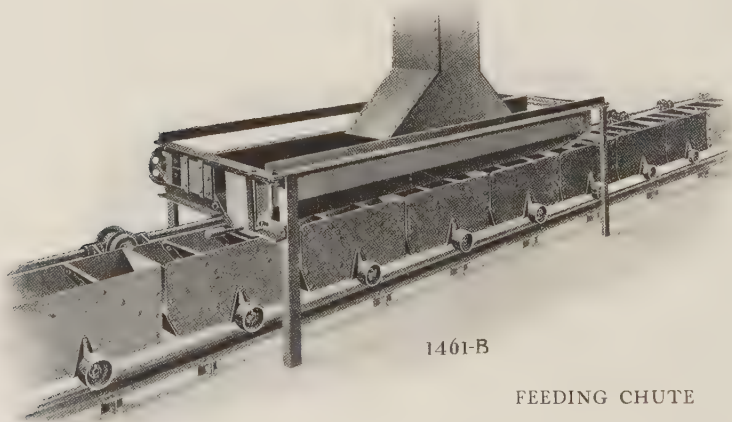
Receives coal from storage under trestle, outside of building, and delivers it into overhead bunker inside the boiler house, at the rate of 50 tons per hour.

The Link-Belt Transfer

Patented February 12, 1901

The Link-Belt Transfer consists of steel buckets, or boxes, of rectangular cross section, placed end to end with no intervening gaps, and attached at one side to a chain of the Monobar type (see description, pages 232 to 237), around the bolts of which the buckets are free to swing. In the vertical transfer, these boxes are fitted with internal vanes which effectively prevent any of the material from spilling on the upward run. The shape and position of the buckets permit them to be fed from an ordinary chute, or, where maximum loading is desired, from the chute shown in cut No. 1461-B below. This mechanism consists of a V-shaped trough, open at the bottom, through which the material flows to the buckets, the width of the opening or slot being easily adjusted to suit the supply.

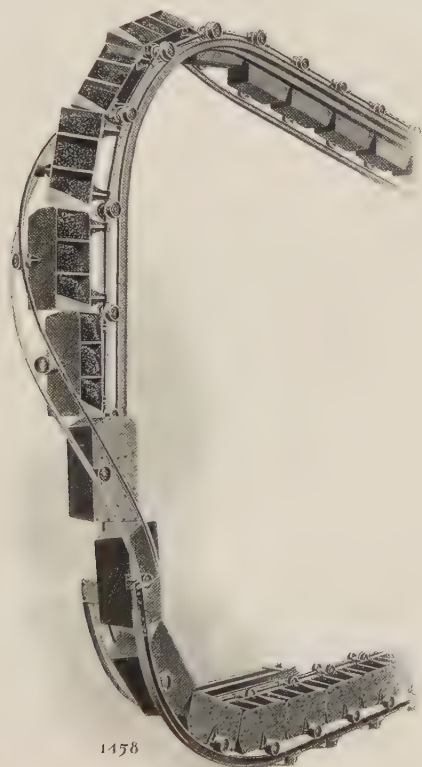
To lessen journal friction and increase the durability of the parts, the buckets are mounted on Self-oiling Rollers.



1461-B

FEEDING CHUTE

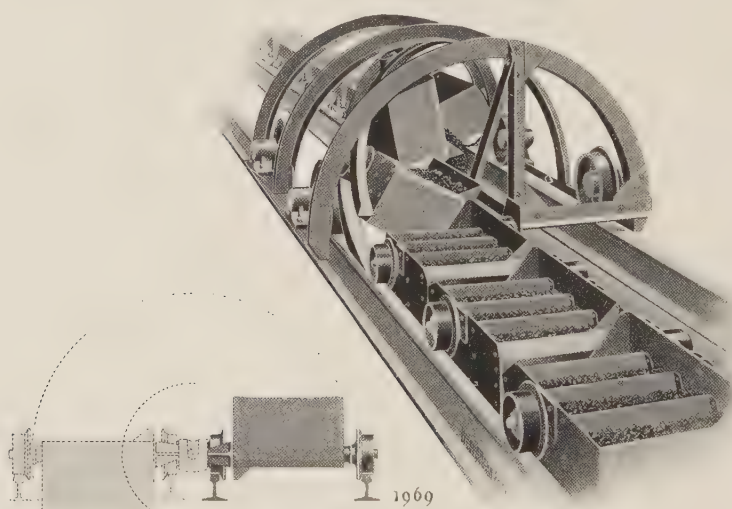
Since a single chain is employed, the buckets are free to run in any path into which the chain can be led, and therefore the transfer may assume the vertical position shown in cut No. 1458, or may run in a horizontal plane, or in any plane between the vertical and horizontal, by a proper arrangement



VERTICAL RUN

of wheels and tracks. This is a distinctive, unique and most valuable characteristic of the transfer. It is well illustrated in cut No. 1962, page 73, where coal is loaded into the lower run, outside the walls of the boiler house, and discharged from the upper run into a bunker within the building.

Referring to cut No. 1458, page 75, in order to keep the buckets open side up, the guide rollers on the outside of the bucket, while making the vertical run, are guided through a helical path, turning, as they ascend, around the Monobar bolt as an axis. After completing the vertical movement, the carrier takes the upper horizontal path till, by means of the curved rail in the dumping carriage (see cut No. 1969), the buckets are revolved about the Mono-



THE DUMPING CARRIAGE

bar bolt as a pivot, and the contents pour out at the desired point. This point of discharge is simply and easily located by means of the movable dumping carriage, which travels on the rails that carry the chain and bucket rollers, no extra track being required.

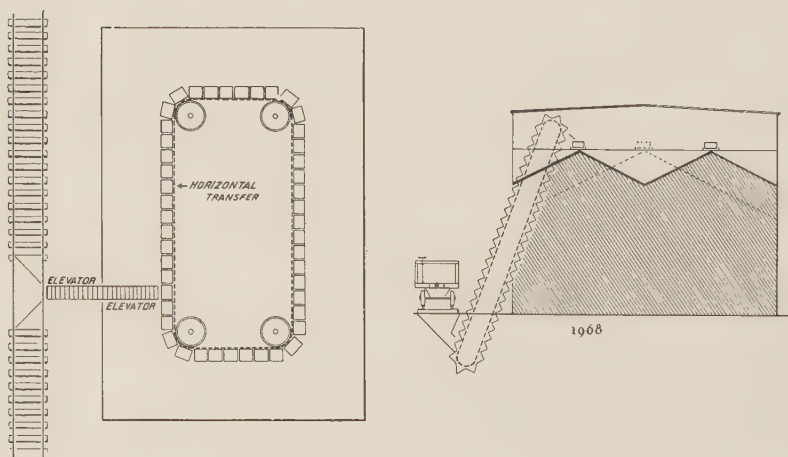
The Horizontal Transfer

The Link-Belt Transfer is the only bucket carrier which will distribute material around a horizontal path; and with it, this path may be of any length and any width. As a means of distributing material over a rectangular area, it has a very wide field of usefulness. All those who are familiar with the construction of pockets for coal storage know that a square bin is cheaper than an oblong bin. The objection to a square bin, however, is the difficulty of properly filling it from a centrally located conveyor, as shown by the dotted lines in cut No. 1968, page 78. The same cut shows how nearly the entire space of a square bin is filled when the material is distributed by the Link-Belt Transfer. This limitation of centrally located conveyors has resulted in the general adoption of the long, narrow bin. The invention of the Link-Belt Transfer makes practicable a return to the more economical square bin.

The distinguishing features of the transfer are:

1. The buckets are secured to a single strand of chain, insuring thereby a flexibility not attained by any other form of bucket carrier.
2. The buckets are hinged to the chain as an axis, making the swing when dumping, transverse to the line of motion. In this respect it differs radically from the Dodge Conveyor and other carriers of that type.

The two critical points of any conveying machine are the point of receiving the material and the point of discharge. When the buckets are overlapping and rigidly held in place, as they are in the Link-Belt Carrier, the problem of loading becomes a very simple one.



In the Link-Belt Transfer, the buckets, while absolutely flexible to adjust themselves to any path of the carrier, are as rigid as Link-Belt Carrier buckets when passing under the loading point, and can therefore be loaded from an open chute as readily as a scraper conveyor or a rigid bucket carrier.

The Dodge Conveyor

(Illustrated on pages 80 and 81)

The Dodge Conveyor consists of non-overlapping gravity buckets pivoted between chains, and rigid buckets of less capacity secured by rigid hangers to the chains in the spaces between the gravity buckets and beneath the gaps which separate them.

These rigid supplementary buckets are at all times and in all positions exterior to the arcs through which the gravity buckets revolve. They do not therefore interfere with or limit the direction to be taken by the Conveyor, which is reversible and may make as many turns in the same plane as necessary.

The initial leakage at the loading point, as well as the spill when the gravity buckets separate at the first upward turn in the Conveyor path, is caught by the rigid buckets and as these come into position above the ascending gravity buckets, each delivers its share of the leakage into the gravity bucket next following.

The Dodge Conveyor is therefore cleanly in operation, simple, safe, practical and durable.

Having no overlapping buckets or lip extensions, the vexatious accessories of cams and complicated loading devices are dispensed with, and a Conveyor which is always ready for work takes its place in the practically equipped plant.

The pivoted bucket carrier was, in its primary form, a simple device with but one obvious defect—leakage of the coal or other material at the loading point through the clearance space between the buckets.

Subsequent invention, aimed at *stopping the leak*, has complicated the machine and only lessened the leakage.

The Dodge Conveyor is a return to simplicity. Its designer accepts the leakage as an unavoidable consequence of the clearance between buckets necessary to practical operation, and arranges in the simplest way to carry to the discharge point the material which leaks through, instead of letting it fall under the conveyor to there accumulate and cause disaster.

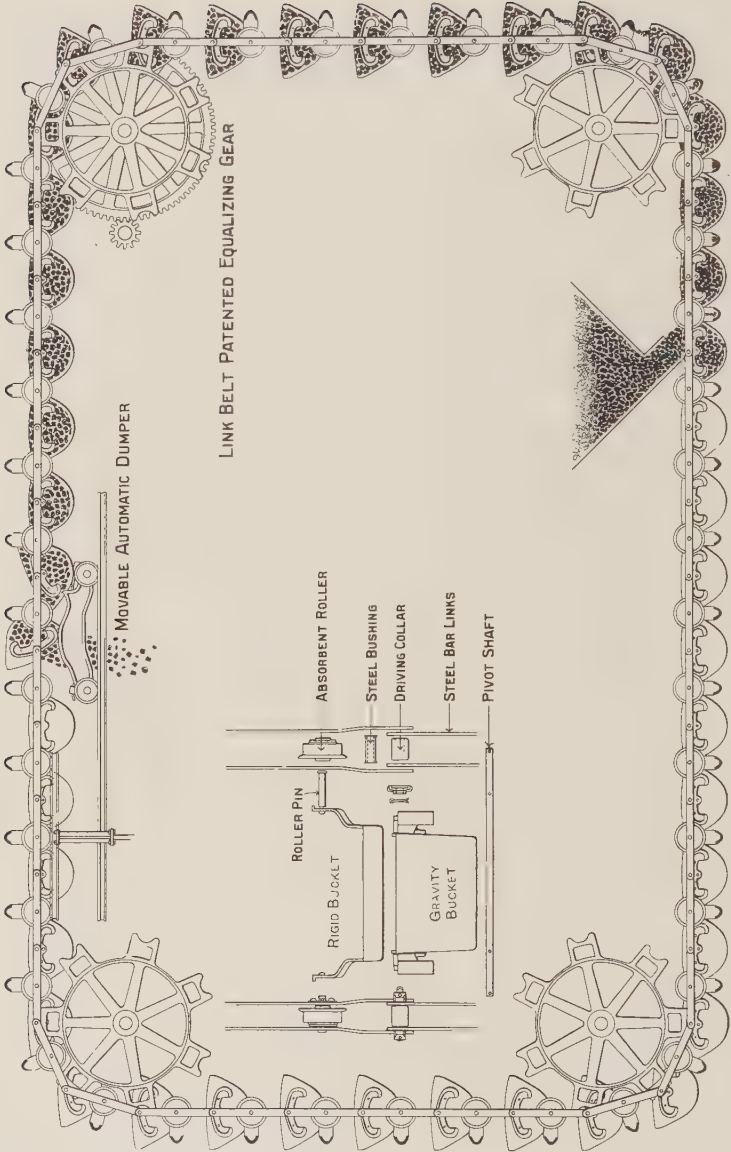
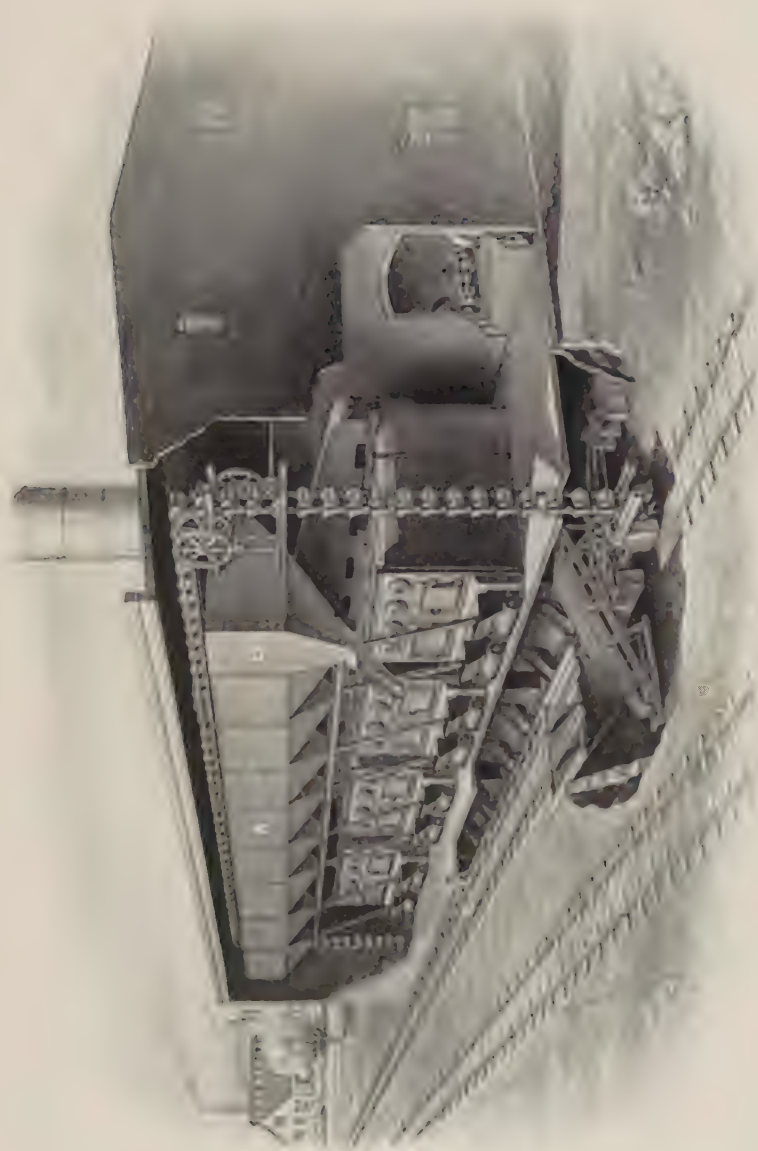


DIAGRAM SHOWING OPERATION OF THE DODGE CONVEYOR



DODGE CONVEYOR
Handling coal and ashes in boiler house

The view on page 81 shows a typical arrangement of coal and ashes handling machinery in a modern establishment.

Coal is received on track "C," adjacent to the building, and delivered into the bucket carrier by an apron conveyor which combines the functions of feeding and regulating, making it unnecessary to keep a man at this point.

The coal bunker, "A," is arranged to deliver by gravity through proper chutes into the stokers; and at one end of the bunker is placed bin "B," for holding the ashes.

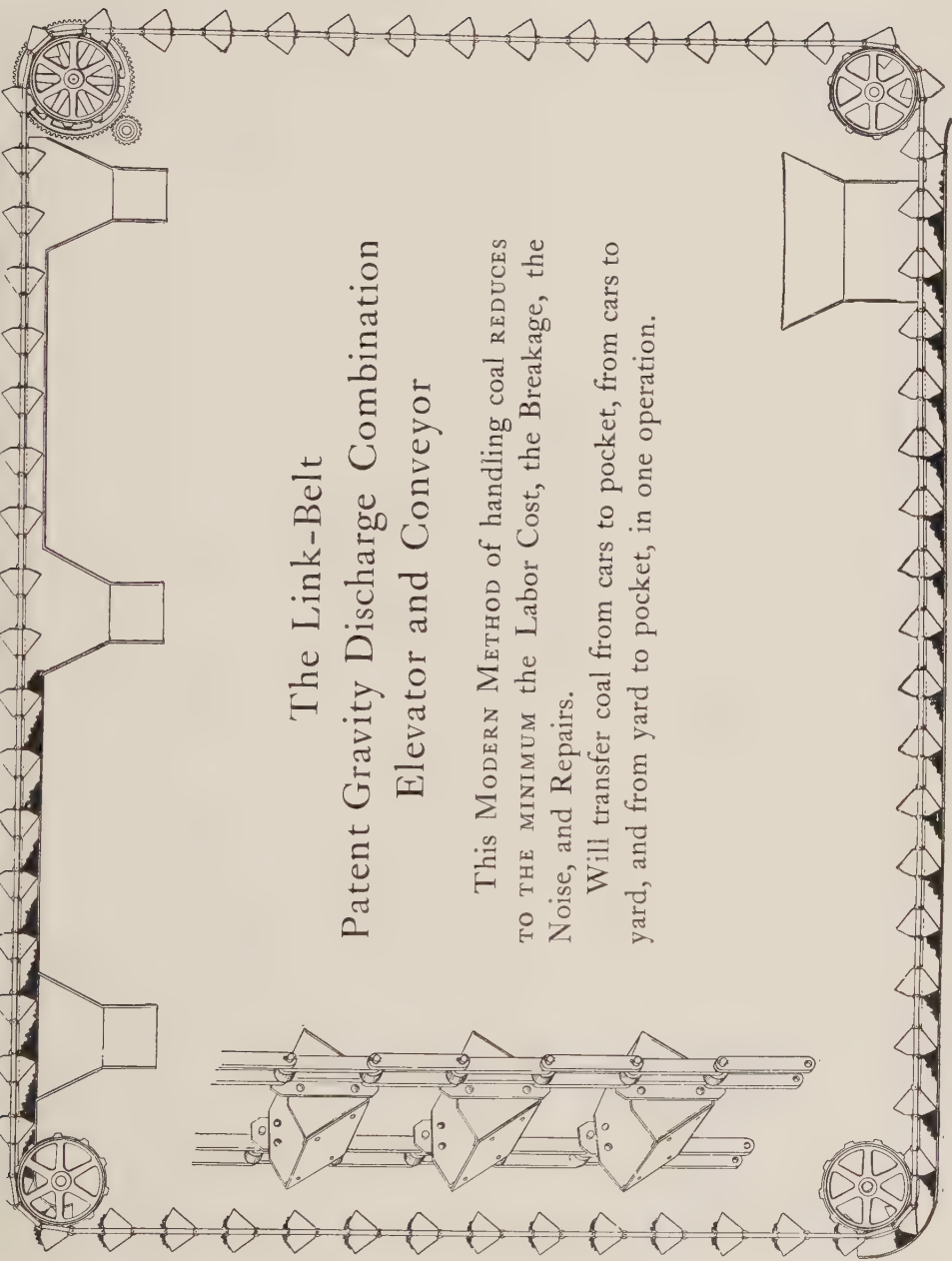
The carrier encircles the coal bunker and ashes bin, returning through the basement under the boiler room floor. The carrier is so placed with reference to the boiler fronts that the ashes can be conveniently delivered to it through suitable chutes.

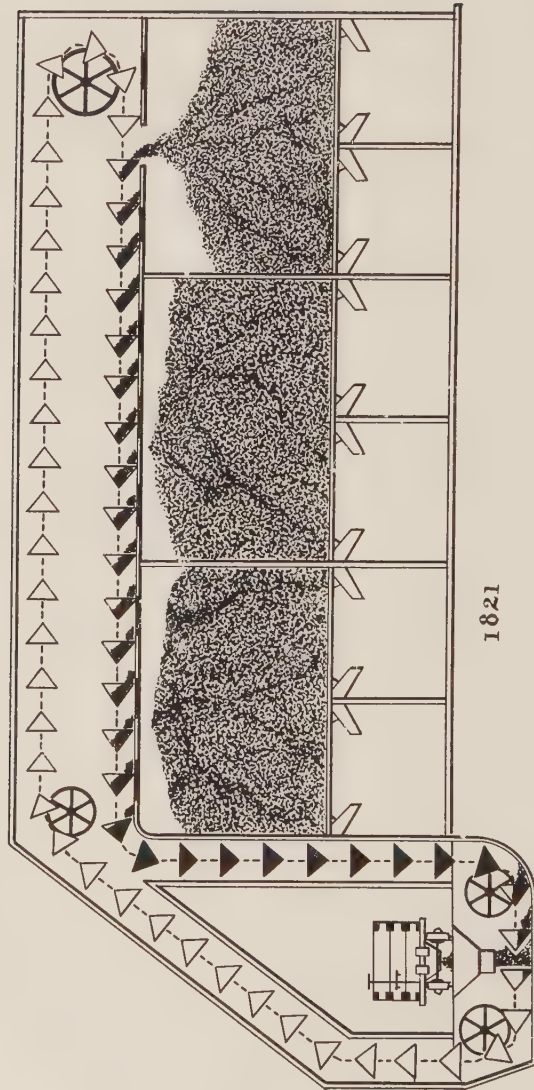
The entire arrangement is exceedingly simple, and, with the rugged construction employed, the lowest possible cost of handling and maintenance is secured.

The Link-Belt Patent Gravity Discharge Combination Elevator and Conveyor

THIS MODERN METHOD OF HANDLING COAL REDUCES
TO THE MINIMUM THE LABOR COST, THE BREAKAGE, THE
NOISE, AND REPAIRS.

WILL TRANSFER COAL FROM CARS TO POCKET, FROM CARS TO
YARD, AND FROM YARD TO POCKET, IN ONE OPERATION.



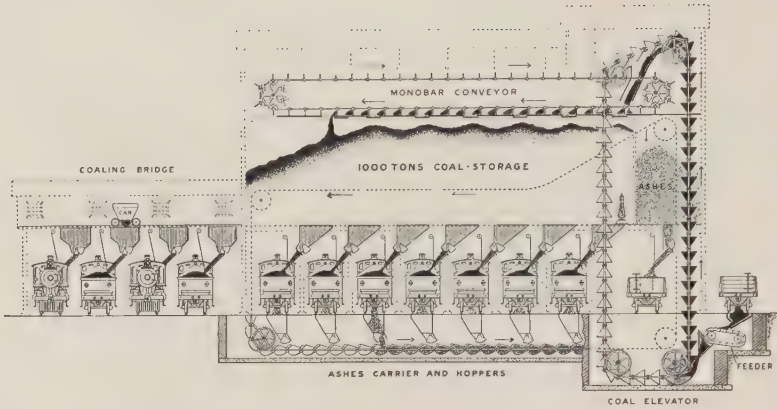


LINK-BELT PATENT GRAVITY DISCHARGE COMBINATION ELEVATOR AND CONVEYOR
An excellent form of conveyor for handling coal and other non-abrasive materials. While it requires more power than a Link-Belt Carrier, Conveyor or Transfer, it forms an exceedingly rugged and simple apparatus, and at a relatively low cost.

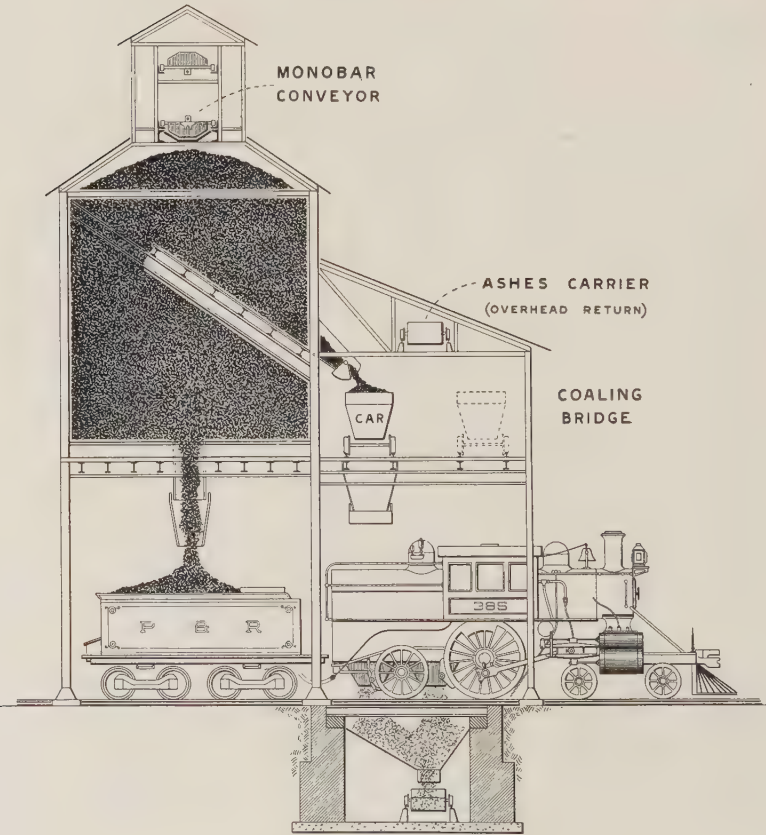


LOCOMOTIVE COAL AND ASHES HANDLING STATION
Philadelphia & Reading Railway, Pennsylvania Avenue Subway, Philadelphia, Pa.
(Terminal and Through Service Type)

Storage pocket extends over track for direct coaling into tenders. Storage capacity : Coal, 1,200 tons ; ashes, 40 tons. Eleven engines can take coal at one time. Sectional drawings of this station shown on page 86.

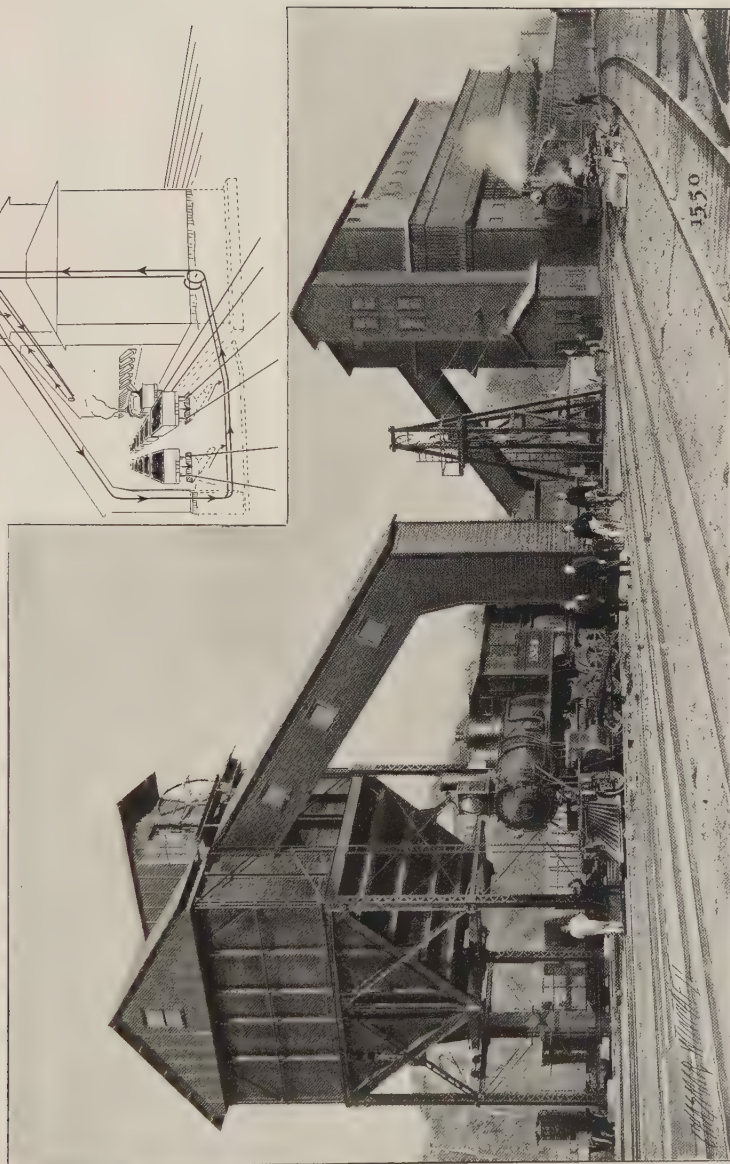


Longitudinal Section



ASHES CARRIER .
Cross Section

LOCOMOTIVE COAL AND ASHES HANDLING STATION
Philadelphia & Reading Railway, Pennsylvania Avenue Subway, Philadelphia, Pa.



LOCOMOTIVE COAL AND ASHES STATION

Erie Railroad, Port Jervis, N. Y.

(Terminal Type)

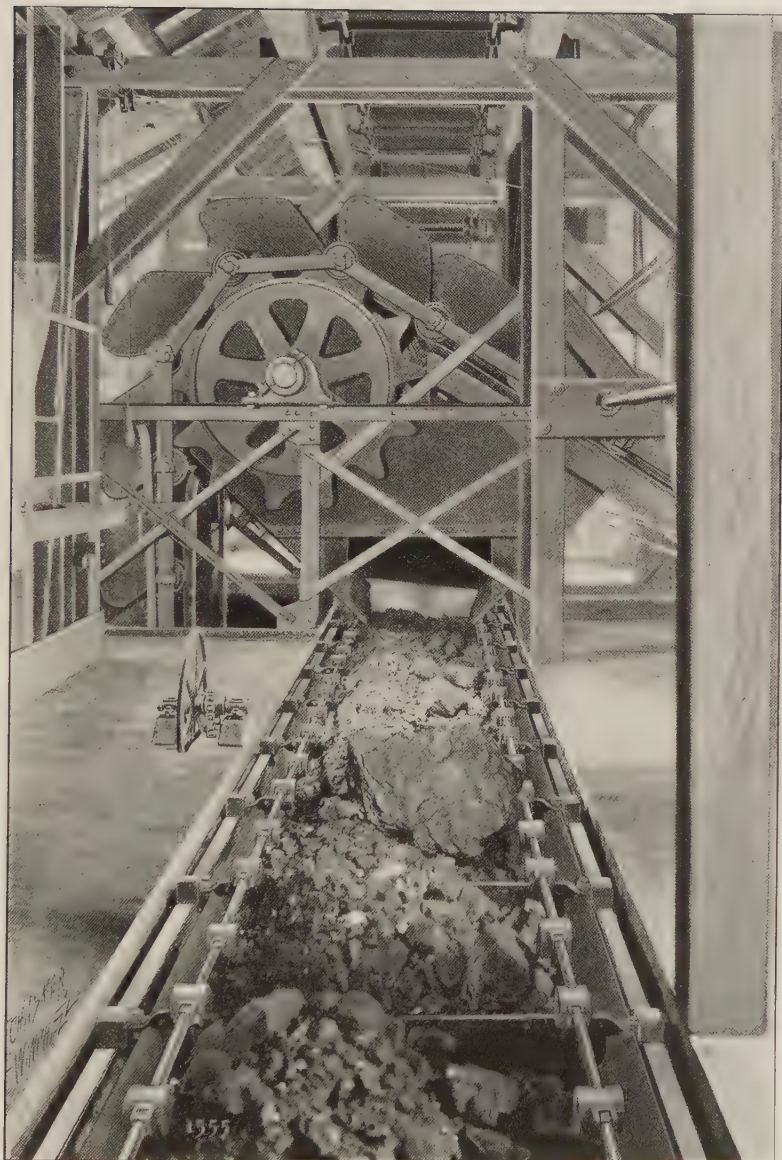
Provided with facilities for automatically mixing anthracite and bituminous coal in varying proportions. Capacity : Coal pocket, 2,500 tons ; ash pocket, 120 tons.



LOCOMOTIVE COAL AND ASHES STATION

Erected 1902-3 for Long Island Railroad Co., Long Island City, L. I., N. Y.

Ashes handling machinery shown in foreground receives ashes from five pit hoppers and delivers to 50-ton steel pocket, the body of which is constructed of expanded metal and concrete. The Coaling Station in background is of 3,200 tons capacity, employs Gravity Discharge Elevator and Conveyor, and coals engines on five tracks. Machinery in this pocket handles coal at the rate of 50 tons per hour.



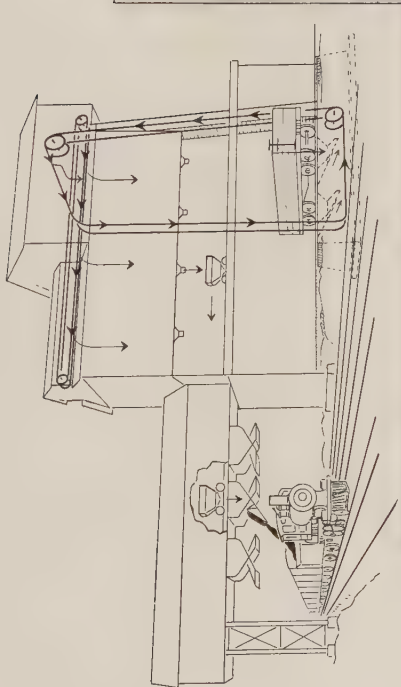
This cut shows Link-Belt Carrier delivering run-of-mine anthracite and bituminous coal (which has been automatically mixed below) into distributing conveyor, over bins, Erie Railroad Co.'s coaling station, Jersey City, N. J. Capacity of pocket, 2,500 tons.



LINK-BELT UNDERCUT GATES AND BALANCED APRONS

Jersey City Coaling Station of the Erie Railroad

The gates are pivoted from the sides of cast iron lip chutes and are opened by dropping them under the chute. They close by cutting upward through the material against the open side of chute, preventing any jamming or breakage. They are closed instantly, even when controlling the flow of lump anthracite; and have proven a highly satisfactory gate for use with *any lump material*. See detail drawings, pages 169 and 170.



LOCOMOTIVE COALING STATION

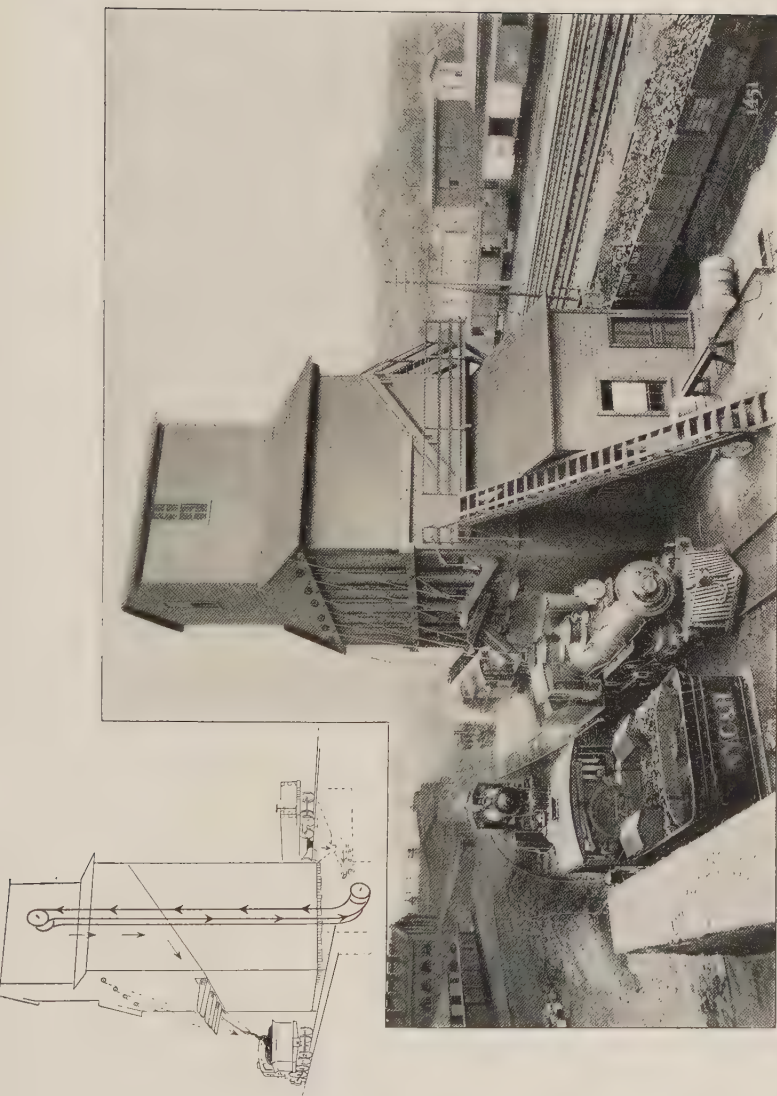
Lehigh Valley Railroad, South Plainfield, N. J.

(Through Service Type)

Capacity, 600 tons. Bridge hoppers store 36 tons. Coal is fed from two track hoppers, reciprocating feeding gates being employed to deliver to Link-Belt Carrier Elevator. Feeding gates are adjustable so that anthracite and bituminous coal can be mixed in varying proportions. All coal is fed to tenders from bridge, storage hoppers on bridge permitting fast coaling.



LOCOMOTIVE COALING STATION
New York Central & Hudson River Railroad, Kingston, N. Y.
(Through Service Type)
Employs Link-Belt Carrier Elevator with Automatic Feed Chute. Capacity of pocket, 450 tons.



LOCOMOTIVE COALING STATION
New York Central & Hudson River Railroad, Utica, N. Y.

(Terminal Type)

Employs Link-Belt Carrier with Reciprocating Feeder. Capacity for 340 tons storage—180 tons in overhead bunkers and 160 tons in auxiliary pocket, located on ground level, from which coal is mechanically elevated to overhead bins as needed. This arrangement reduces the cost of supporting structure and still provides for the mobilization of a large supply of coal.



ASHES HANDLING PLANT
Erected 1903 for the Pittsburg & Lake Erie Railroad, Haselton, Ohio.
200-Ton Coaling Station installed by us at same place.

The method of handling cinders here shown possesses the merit of being economical in first cost and maintenance. It consists merely of a steel pocket lined with concrete and having overhead trolley tracks spanning one or more cinder pits. Locomotives discharge fire box cinders and flue dust simultaneously into pit tubs, which are then elevated and dumped into the pocket.

Suitable machinery is provided for operating trolley wagons on overhead track and for raising, lowering and dumping the tubs.

The view on opposite page shows a single 50-ton pocket provided with two overhead tracks spanning four pits, while the plant shown below has a single track spanning two pits. As each pit is sufficiently long to accommodate two engines, eight can be cleaned simultaneously at the former and four at the latter point.



LOCOMOTIVE COALING AND CINDER STATION

Erected 1902 for the Pittsburg & Lake Erie Railroad, Groveton, Pa. Capacity of coal pocket, 200 tons; ashes pocket, 30 tons.

ASHES HANDLING PLANT

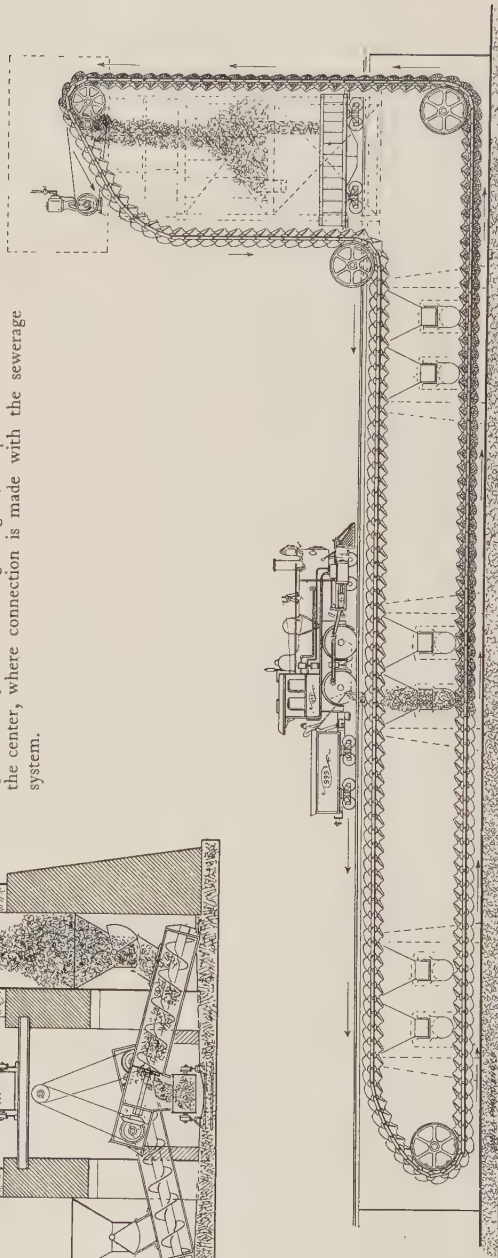
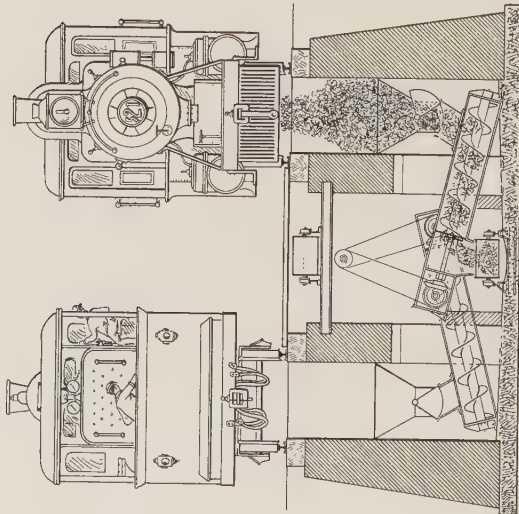
Forming part of Locomotive Coaling and Ashes Station of the Erie Railroad, Jersey City, N. J.

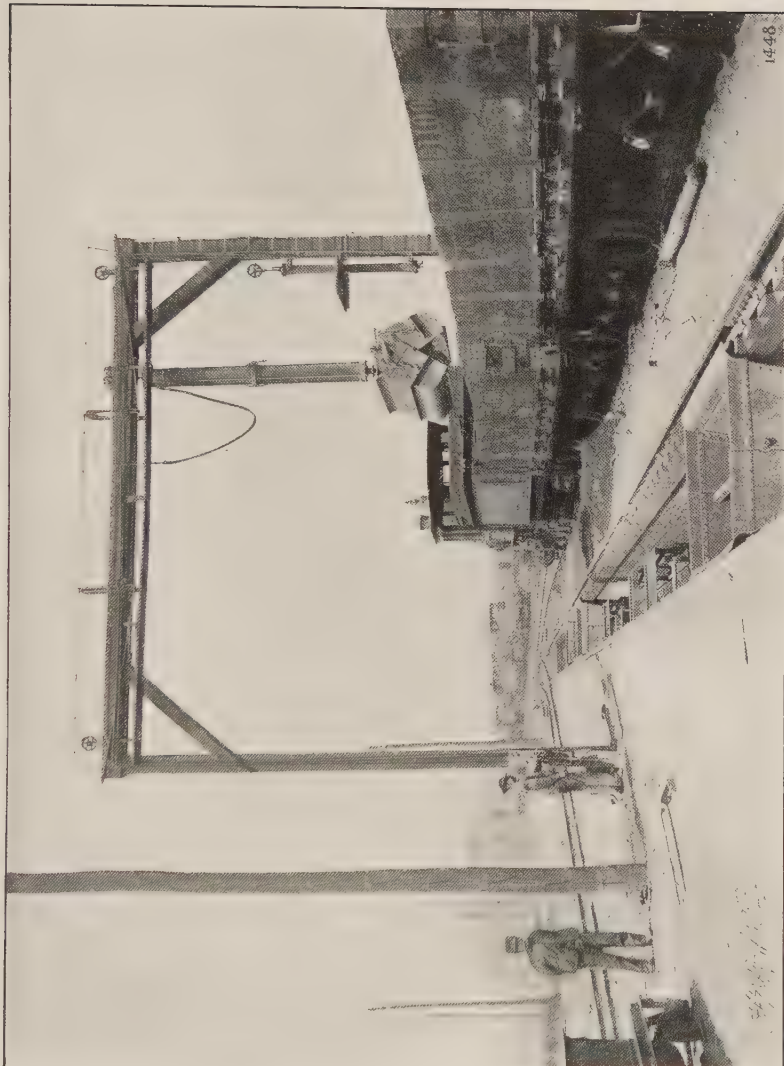
The carrier in this plant occupies the central division of a three-part ash pit, and is supplied from the outer divisions, into which ashes fall from the locomotives, by short lengths of spiral conveyor.

The path of the carrier is horizontal to the end of the pit, then vertical to the point of discharge into an elevated storage hopper, from which the ashes fall by gravity into cars for removal.

Twelve track hoppers, of 170 cubic feet capacity each, receive the ashes from engine fire-boxes.

Drainage is effected by the upward inclination of the spiral conveyors and the grading of the pit floors toward the center, where connection is made with the sewerage system.



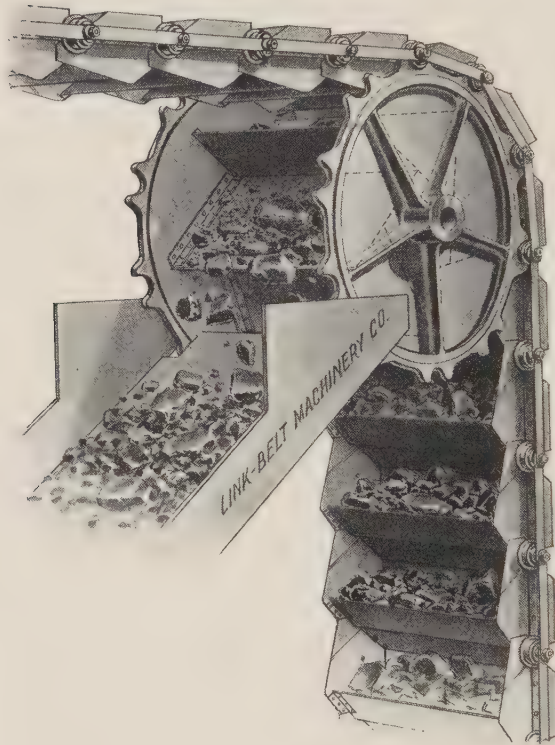


PNEUMATIC ASH HOIST

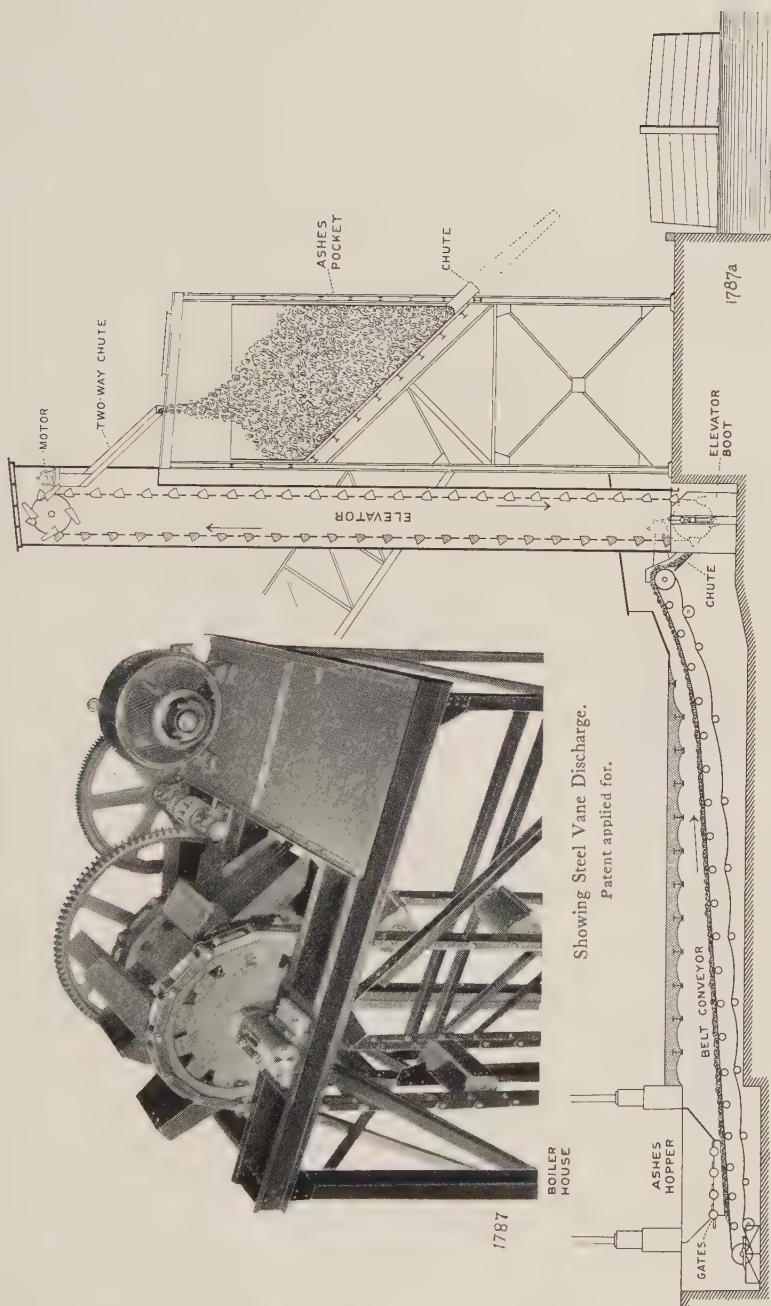
Pennsylvania Railroad Type

Ashes from engine are discharged into pit cars; these are pushed under bridge. The pit car is then lifted, free of trucks, by air cylinder, carried over railroad car and automatically dumped. This constitutes a cheap and effective system for handling ashes, and costs but little for repairs.

Elevator Buckets and Rotary Discharge Head



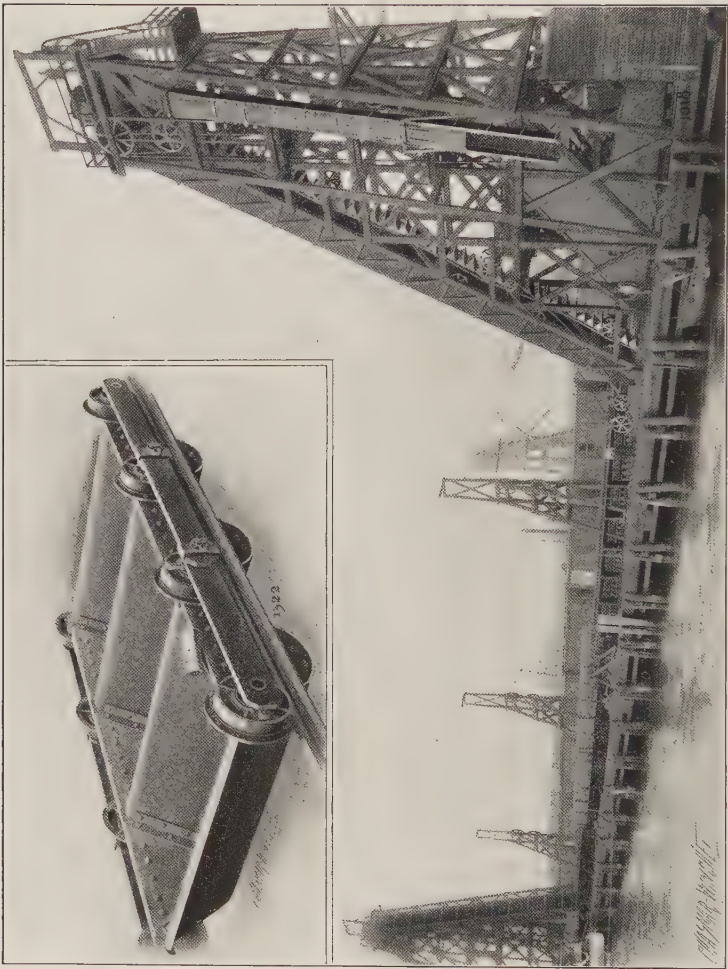
The Rotary Discharge Head permits coal to be carried over the head wheel of the elevator without spilling, and prevents large lumps, which may project over the buckets, striking and doing damage.



ASHES HANDLING EQUIPMENT

Erected 1904 for the New York Edison Company, Waterside Station, New York

The Shallow Trough Belt Conveyor receives ashes from a steel hopper and delivers to Perfect Discharge Elevator. Steel vanes are located between head wheels of the elevator. These vanes serve to prevent the ashes from dropping down the leg of elevator ; effect clean, perfect discharge, and permit running elevator at low rate of speed.



TRANSFERRING PHOSPHATE ROCK

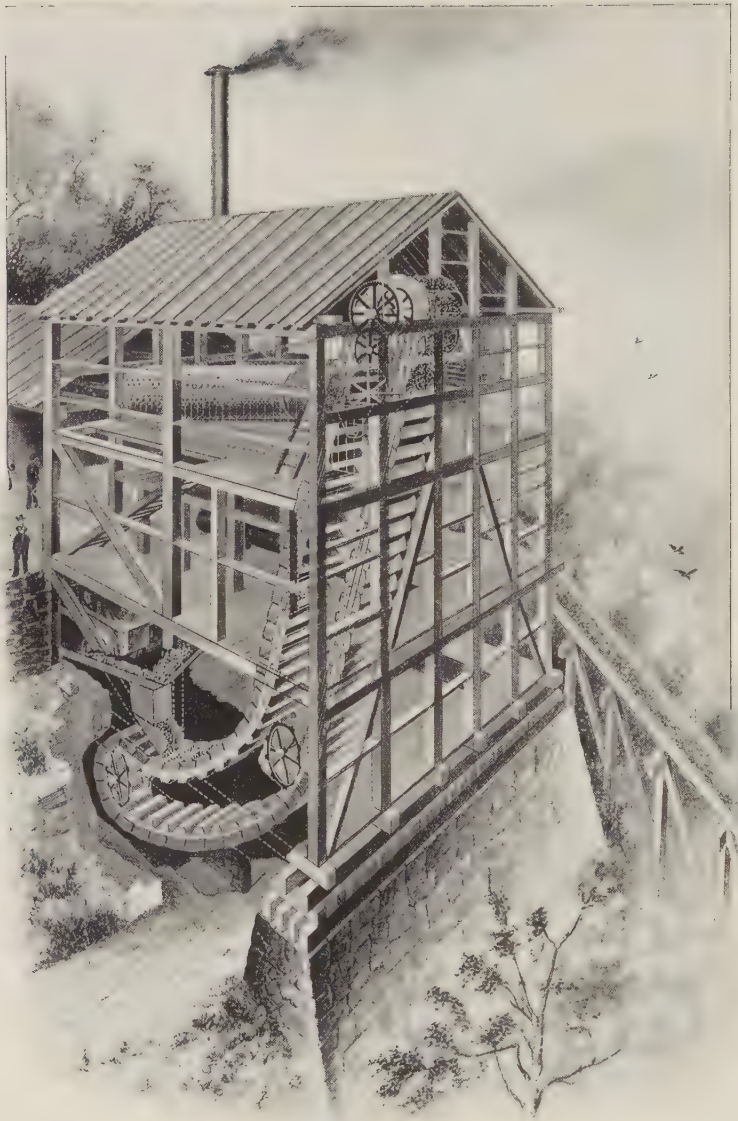
Plant System of Railways, Tampa, Fla.

In operation since 1896. Handles rock up to 12-inch diameter at rate of 6 tons per minute. Plant consists of one 194-foot Reversible, Horizontal, Overlapping Bucket Conveyor into which the rock is unloaded from cars, and two 89-foot Continuous Bucket Elevators which receive from the conveyor and deliver to the vessel hatches through adjustable chutes. Link-belt and manila rope transmit the power from jack shaft driven by electric motor.



Handling phosphate rock from cars to vessels, or cars to storage, and from storage to vessels, at Seaboard Air Line Railway wharf, Fernandina, Fla.

Employs conveyors consisting of endless series of buckets rigidly secured to two strands of chain and provided with overlapping joints. These joints prevent material from dropping between buckets. Conveyors are equipped with Link-Belt Self-oiling Rollers.



LINK-BELT CARRIER ELEVATOR

With Horizontal Feeding Loop

Handling stone at crushing plant of The Long Clove Trap Rock Co., Haverstraw, N. Y.

The Link-Belt (Open Top) Carrier

IN STONE CRUSHING PLANT OF THE
LONG CLOVE TRAP ROCK CO., HAVERSTRAW, N. Y.

Two crushers are employed, and delivery to the carrier is made from these through stationary chute in the floor of crusher room.

The carrier buckets are, at the lower end of elevator, deflected into a horizontal loop, delivery from chute being made into buckets while in horizontal position. The buckets are overlapping, and this method of feeding makes them receive the entire load without any spilling; there is consequently no accumulation of material around the pit, as in the case of ordinary elevators, thus obviating the most frequent source of break-downs in rock-handling elevators.

Rock up to eight inches in diameter is handled at the rate of *sixty cubic yards per hour*.

The machine was installed in July, 1897, since which time, as an outgrowth of the experience gained in its operation, the following changes have been made: The upper sprockets have been made of cast steel; the wheels at the turn of the lower run, as well as the foot wheels, have been made plain, with steel tires; chilled iron rollers have been replaced by steel rollers which are bushed with phosphor bronze, while the steel bucket links have been bushed in the same manner. The feeder has been dispensed with, delivery being made through stationary chute.

The buckets are in good order after having carried over three hundred thousand tons of rock.



LINK-BELT OPEN TOP CARRIER

Pennsylvania Coal Company, No. 14 Breaker, Plains Junction, Pa.

Erected 1902

View shows section of 357-foot Centres Machine handling run-of-mine coal from mouth of shaft to breaker at the rate of 500 tons per hour. The coal is delivered to the carrier by means of Link-Belt Reciprocating Feeders.

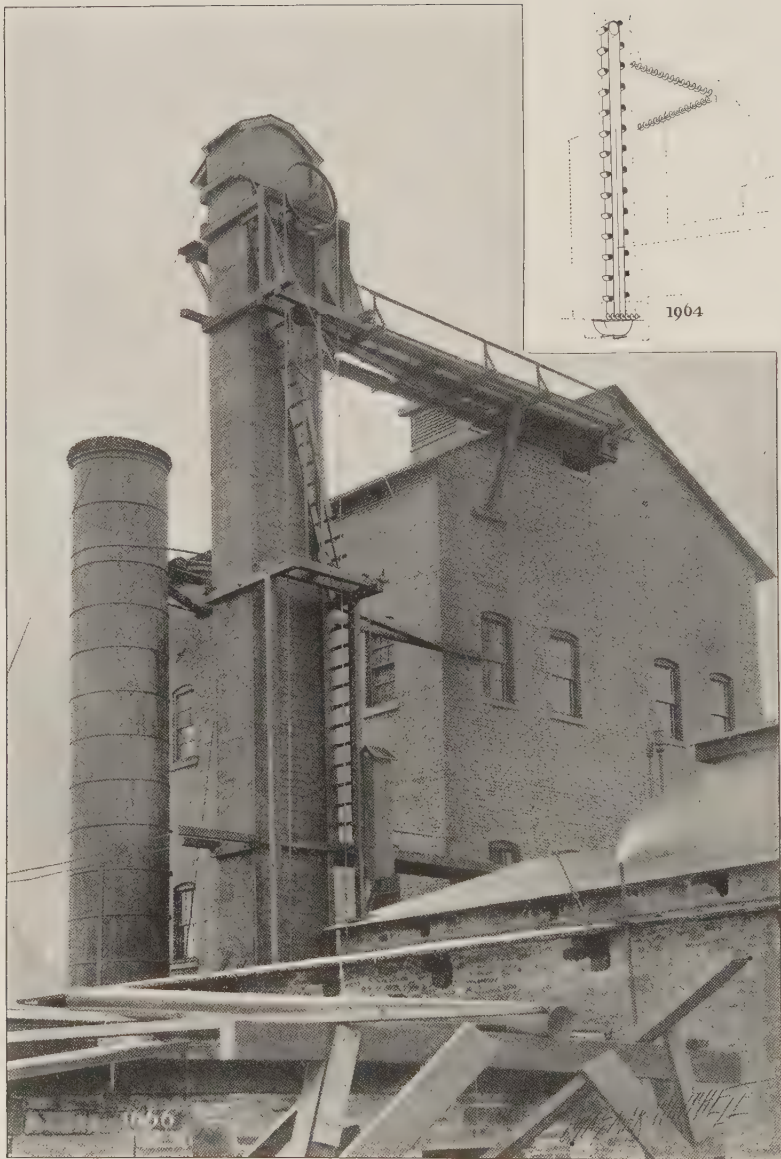
See pages 71 and 72 for illustrations and description of Reciprocating Feeder.



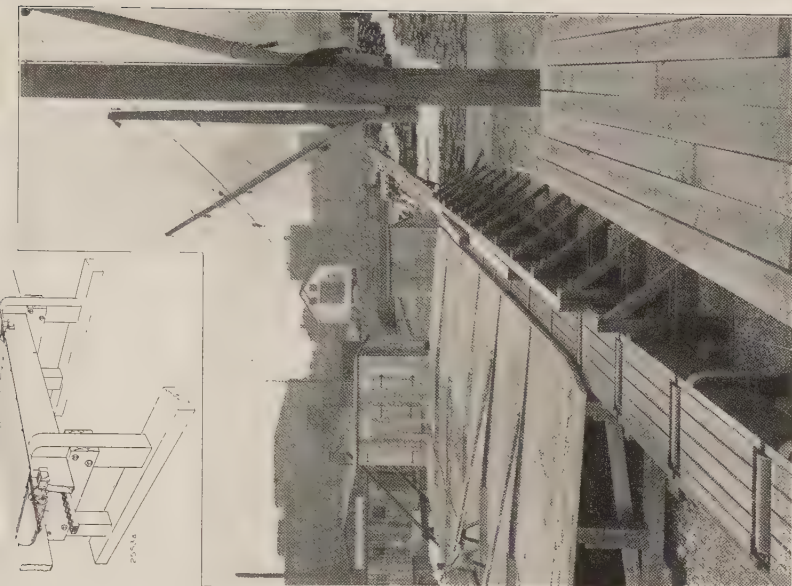
CONTINUOUS BUCKET STONE ELEVATOR

On single strand of Ley bushed chain

Glen Mills Crushed Stone Co., Glen Mills, Pa. 47 foot centers. Capacity, 1 ton per minute



RUBBER BELT CHIP ELEVATOR AND SCREW CONVEYORS
Malone Paper Co., Malone, N. Y. For handling wood chips.



LIVE ROLL LUMBER CONVEYOR

One of two aggregating 792 feet in length installed 1903 at the Susquehanna Avenue, Philadelphia, Wharf of the Wm. M. Lloyd Company. Operated by electric motors and Ewart Detachable Chains. Either machine may be stopped and started at different points along its length.



BLOCK CARRIER

At works of The Philadelphia Excelsior Co.
Strongly built to stand hard usage



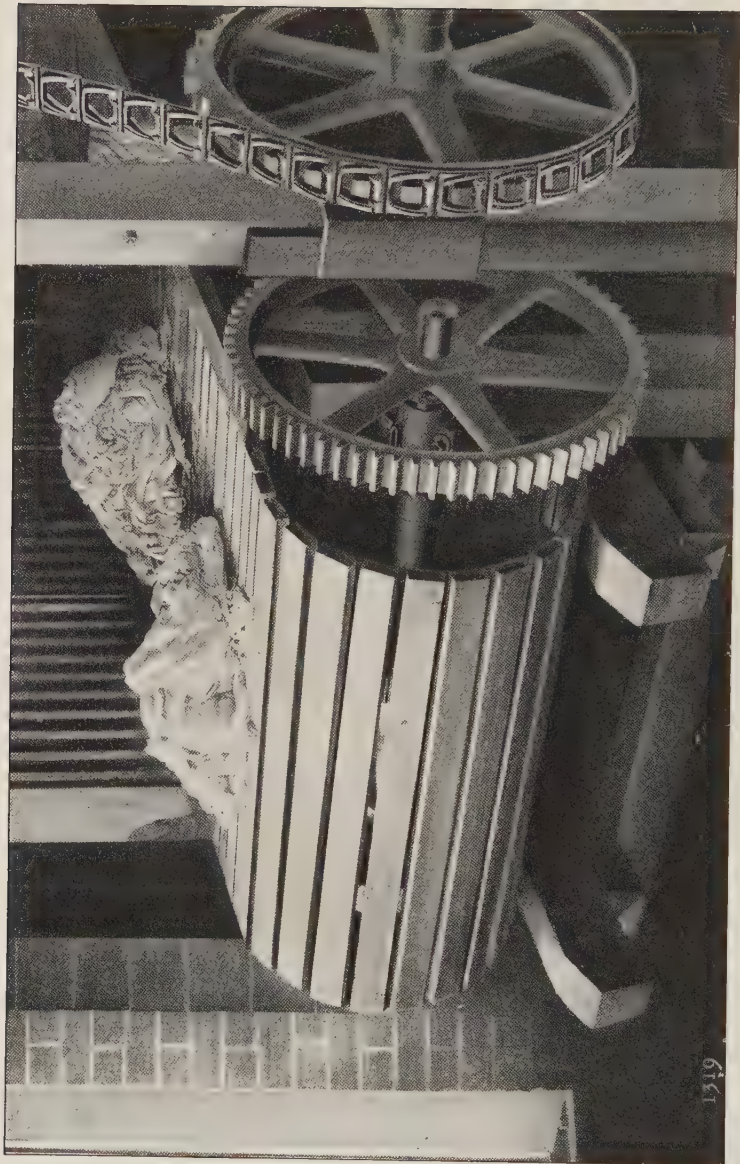
LOG HAUL

Employing No. 1075 Giant Chain, carrying 1,800 logs per day at sawmill of H. Witbeck Co., Marinette, Wis.



LUMBER ELEVATOR

At mills of Knapp, Stout & Co., Fort Madison, Iowa. Capacity, 50,000 feet per day.



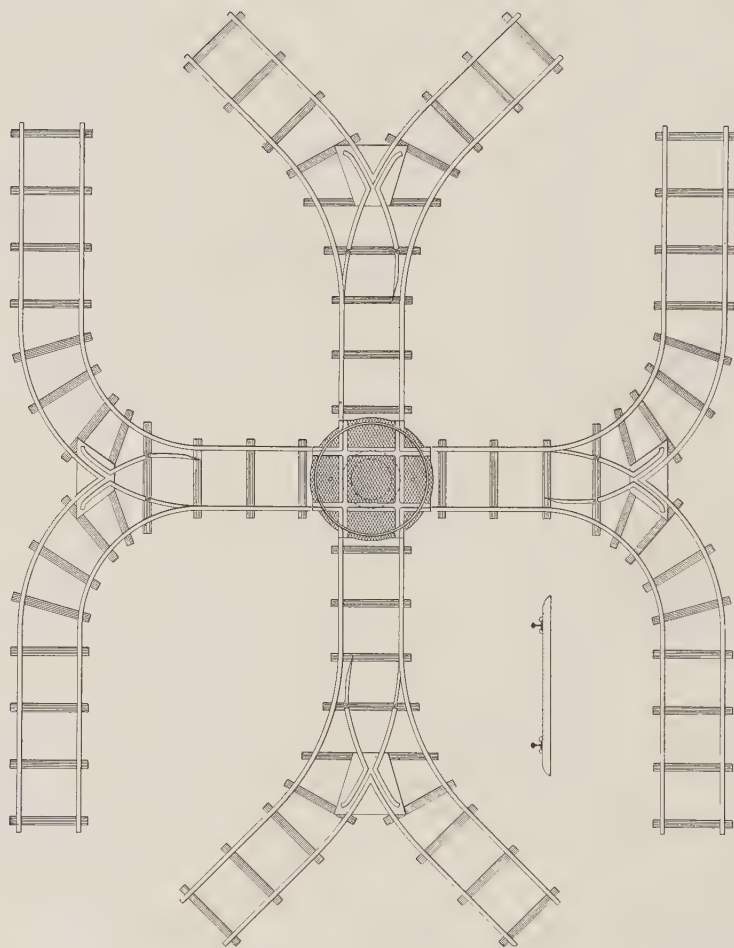
HIDE CONVEYOR

F. Blumenthal & Co., Wilmington, Del.

Carries 36,000 morocco hides daily, and so constructed that the hides cannot be pinched or otherwise injured.



HIDE ELEVATOR
McNeeley's Tannery, Philadelphia, Pa.
Used for lifting wet skins.

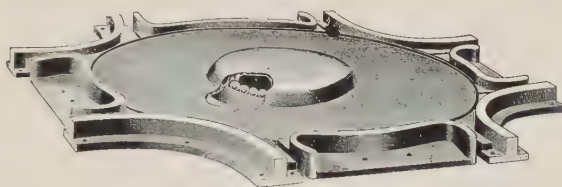


We manufacture and supply industrial railways complete, including tracks, frogs, switches, ball-bearing turn-tables and cars of any shape, to fit location, space or requirements.

The Link-Belt Ball-Bearing Turn-Tables

For sizes carried in stock, and price lists, see page 280.
Other sizes will be made to order.

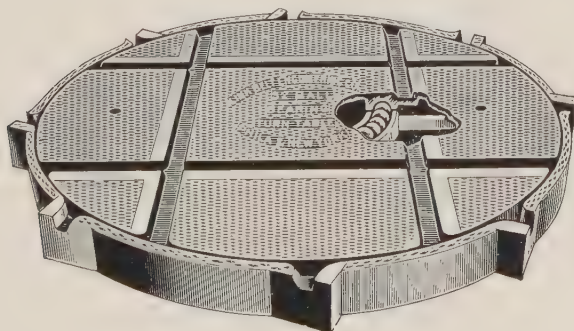
TYPE "A"



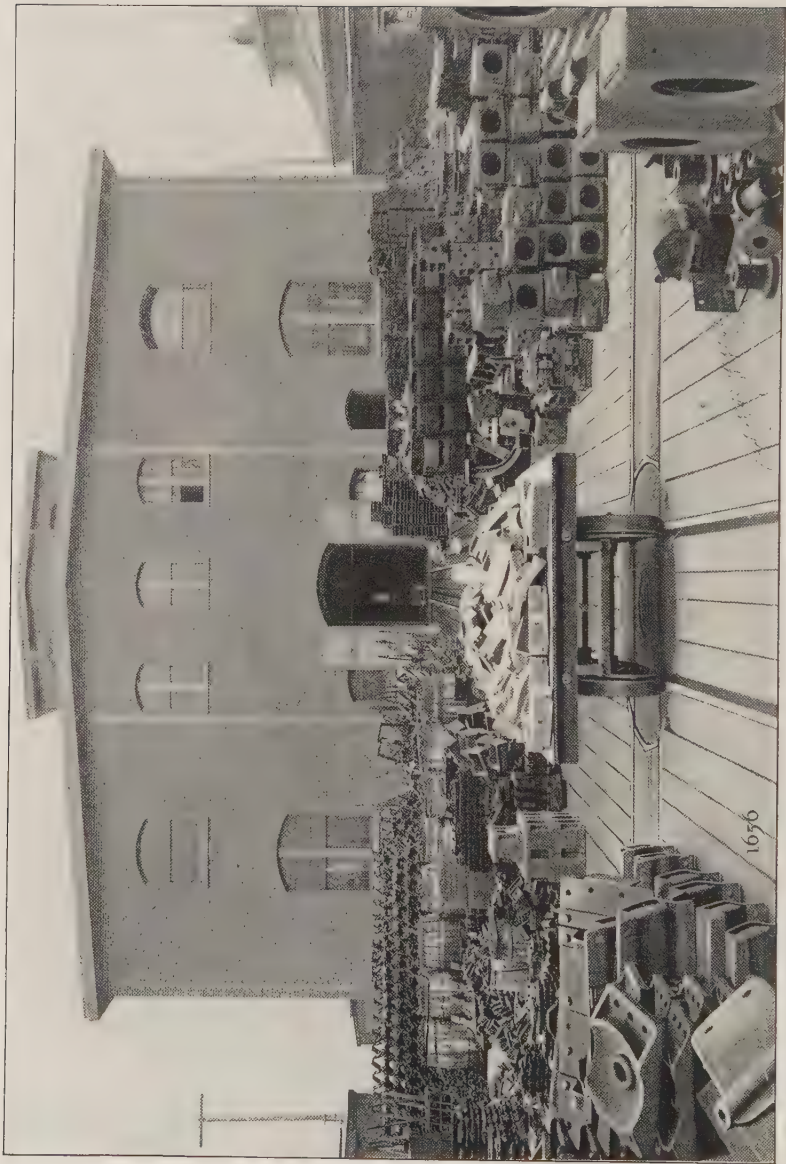
Construction is such that load is balanced, even when not central, thus relieving corner guards of weight and bringing entire load upon the balls. This insures great ease of operation, as, when heavily loaded, it can be readily swung around by *one man*. Guard rails guide cars to track from any position.

No pit or foundation is required, the base of the table being flush with bottom of rail.

TYPE "B"

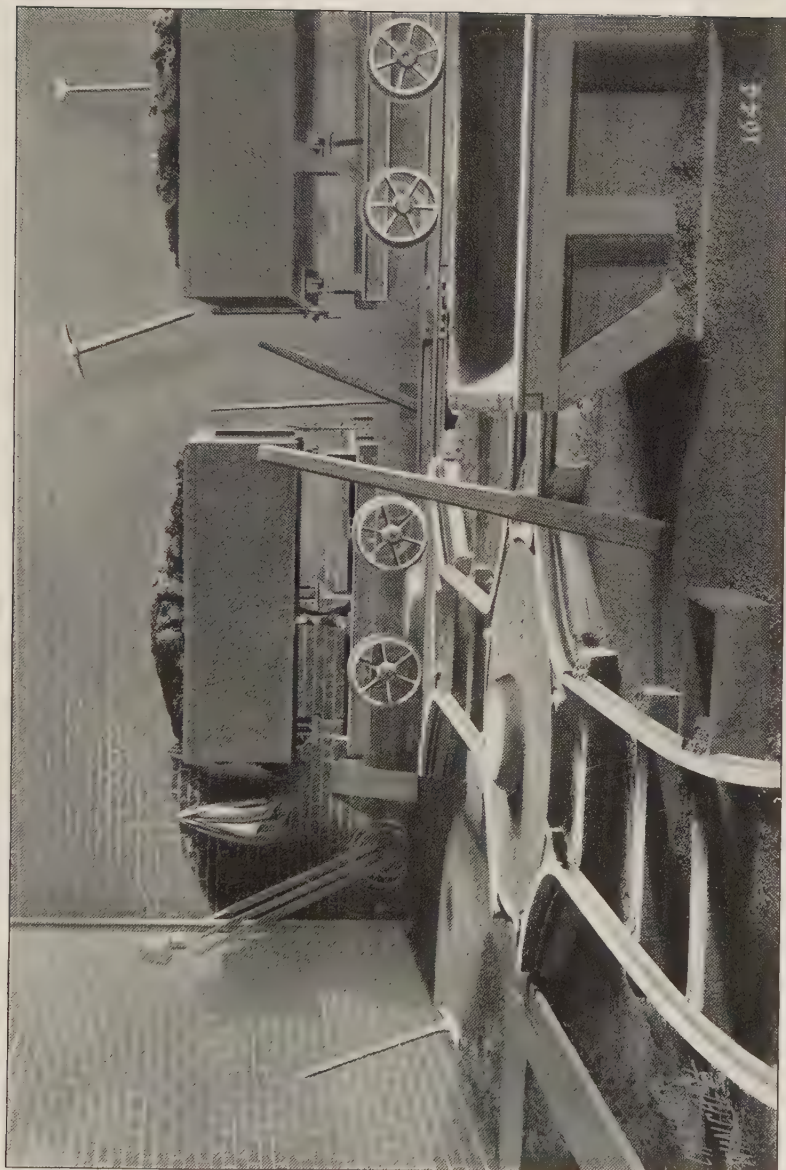


In cases where it is necessary that there be no part of turn-table above floor level we supply the flush top form "B."



LINK-BELT INDUSTRIAL RAILWAY

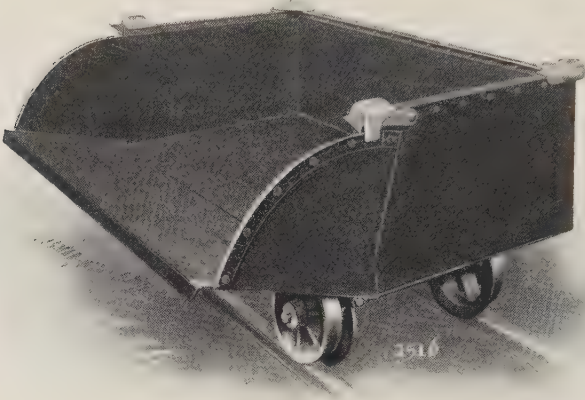
At storehouse of Reading Railway, Packerton, Pa. Consists of one-half mile of track and 17 turn-tables.



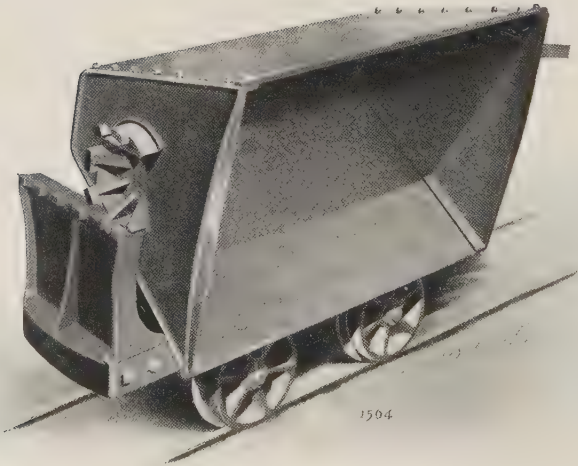
RAILWAY SYSTEM AND CARS FOR DRIED SHALE
Works of Montello Brick Co., Reading, Pa. Employs 14 of our ball-bearing turn-tables.

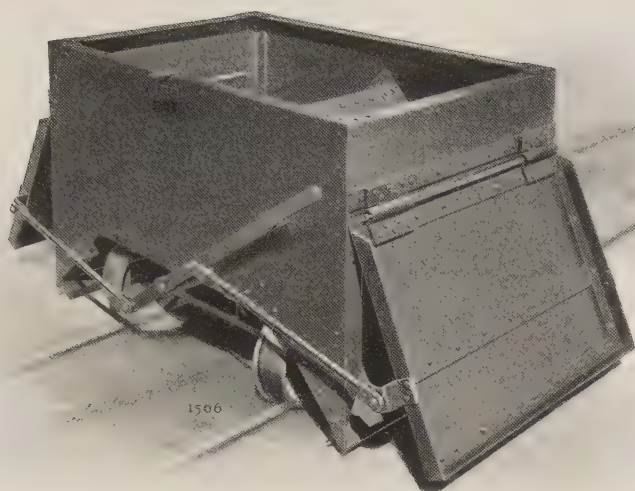
These cars built in wide range of variety and capacity.

CHARGING
CAR,
DROP
SIDES



SIDE
DUMPING
TILTING
CAR

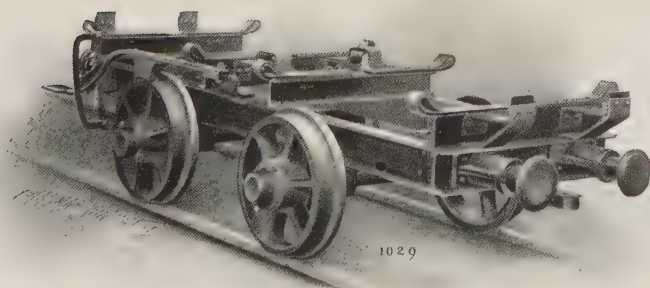




SIDE
DUMP
CAR



BOTTOM
DUMP
CAR

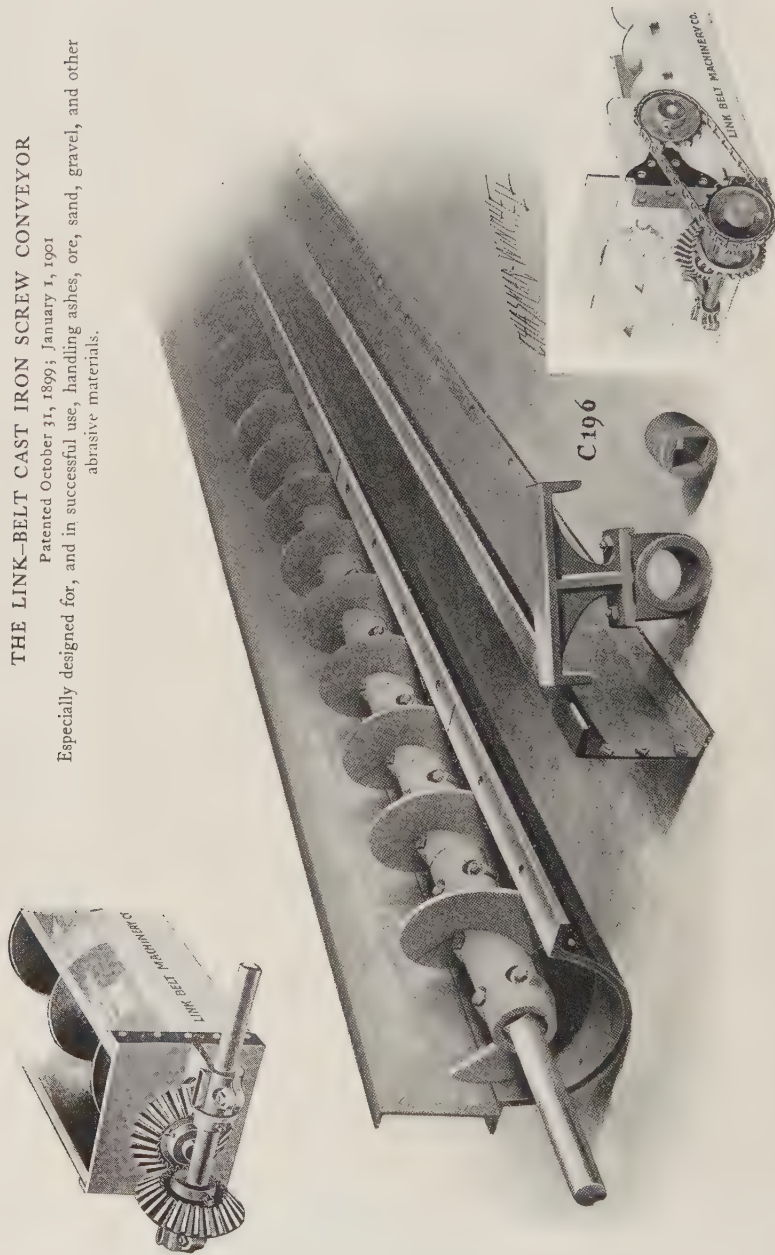


SPECIAL
CAR FOR
CARRYING
BUCKETS

THE LINK-BELT CAST IRON SCREW CONVEYOR

Patented October 31, 1899; January 1, 1901

Especially designed for, and in successful use, handling ashes, ore, sand, gravel, and other abrasive materials.



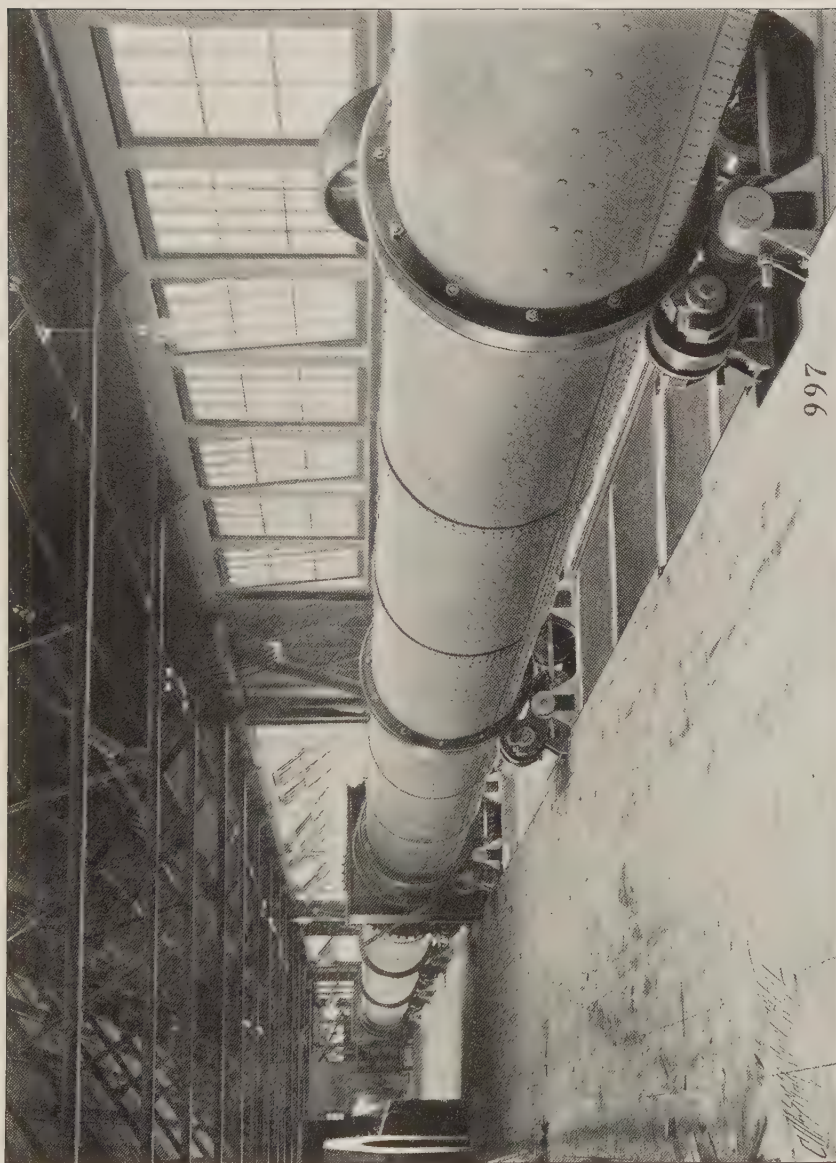
The conveyor is made up of heavy cast-iron flights, independently removable, on square shaft. The journals and bearings are made respectively of case-hardened steel and chilled cast iron, and are conveniently and cheaply renewed. The bottom of trough is made of cast iron, and sides of channel iron or heavy rolled steel, as may be desired.

“It works perfectly and is entirely satisfactory.”—*Wm. Garstang, Supt. Moivre Power, C., C., & St. L. Railway, Indianapolis, Ind.*

Photograph shows cast-iron flights made in halves. These are also made solid when indicated.

The following regular sizes are made: 10 inches, 12 inches, 14 inches, 16 inches and 18 inches.

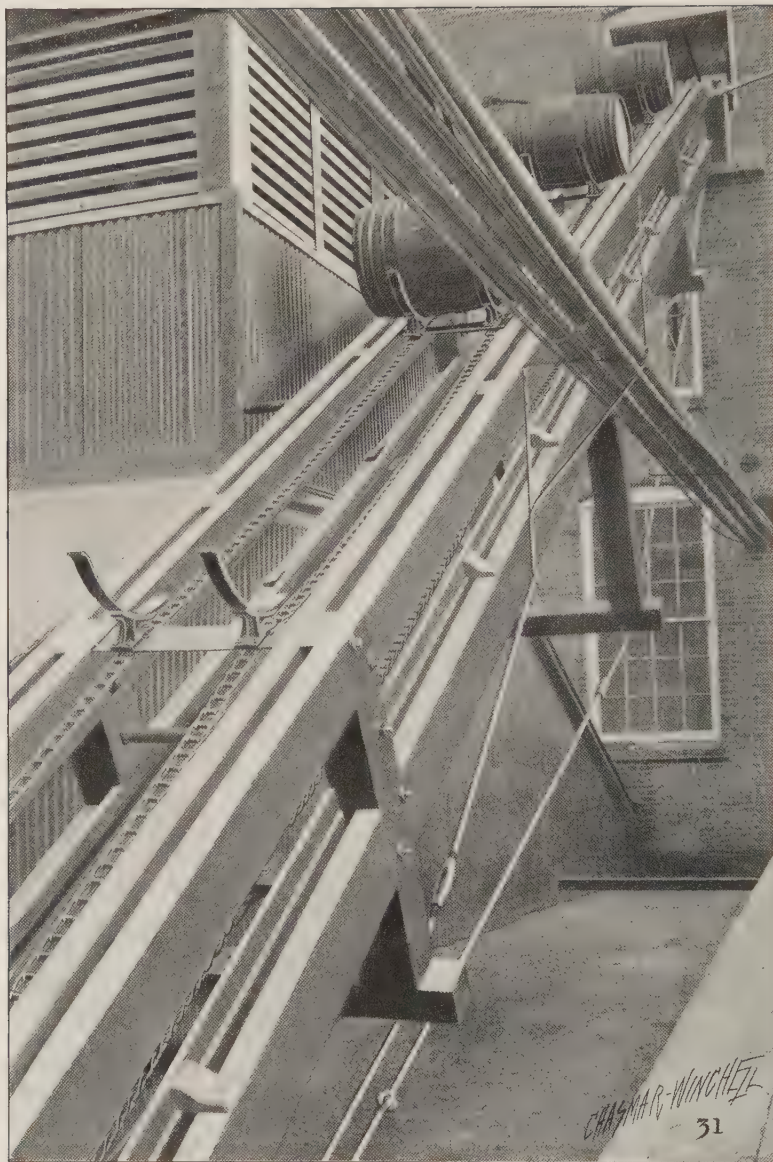
For other illustrations of screw conveyors see pages 258 and 259. Prices upon application.



STEEL ROTARY CONVEYOR

Patented

For conveying and cooling or drying cements, soda, metallic ores, etc.



AUTOMATIC PICK-UP AND DISCHARGE BARREL ELEVATOR

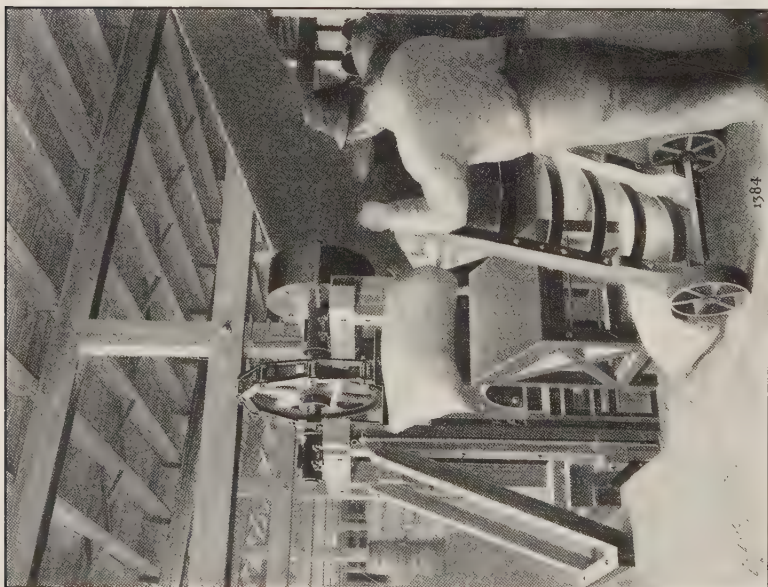
The W. J. Wilcox Lard & Refining Co., Weehawken, N. J.

Capacity, 6,000 tierces per day.



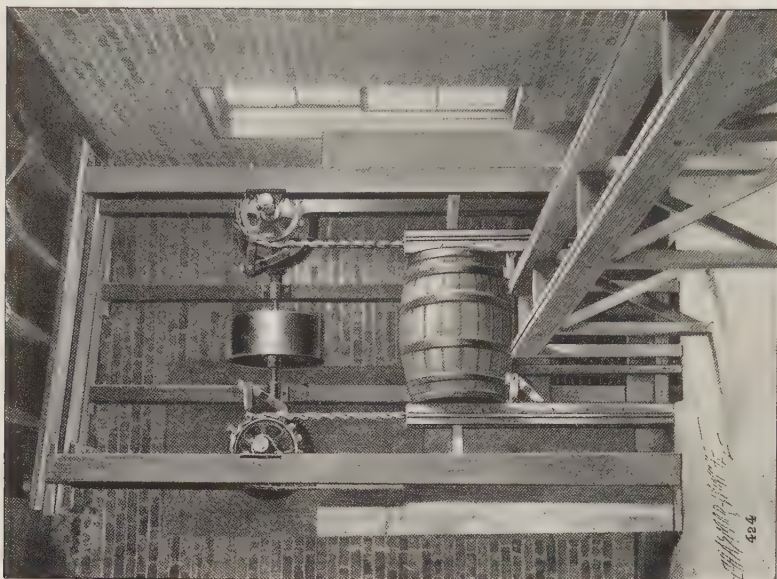
RIGID ARM BARREL ELEVATOR ON WOOD FRAME

Ewart Link-Belt. Malleable iron arms. Gearing between head wheels. Belt driven.



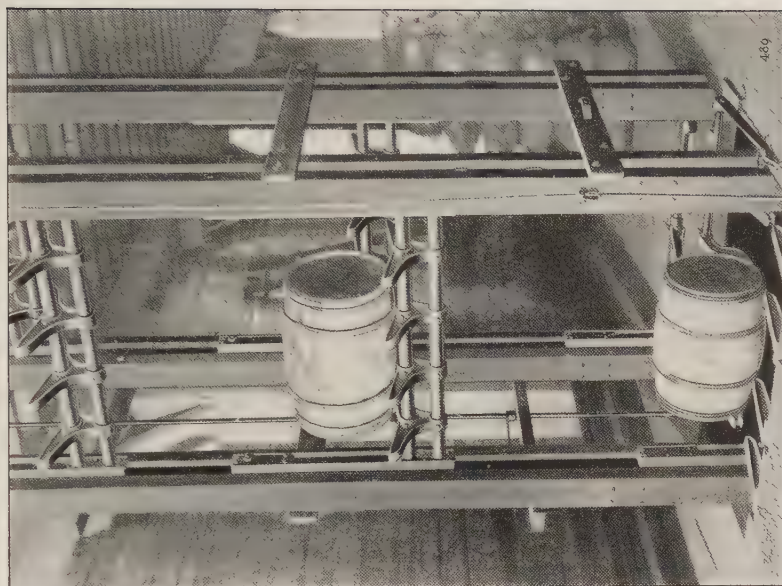
HEAD OF BARREL AND SACK ELEVATOR

One of six on double-deck pier of Lehigh Valley Railroad,
Jersey City, N. J.



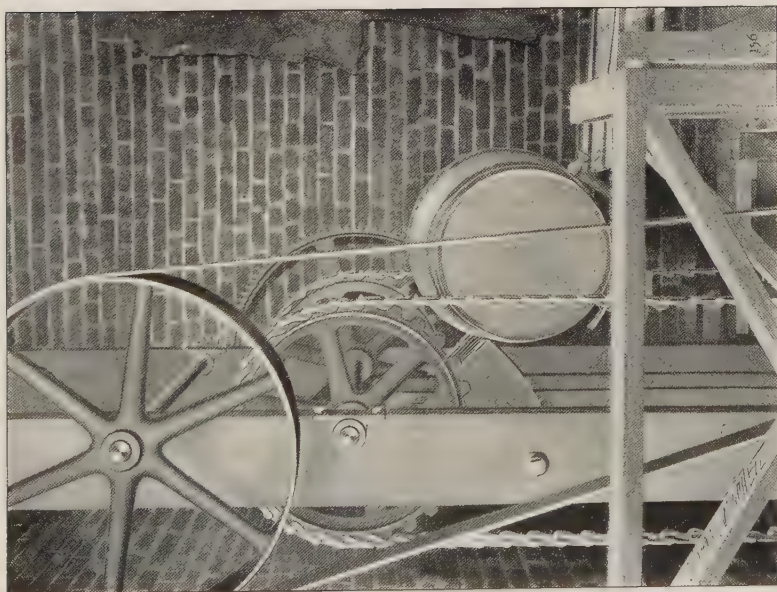
CONTACT DISCHARGE BARREL ELEVATOR

At works of Standard Oil Co., Whiting, Ind.
Sprocket wheels in same plane. Automatic in pick-up and
discharge. Capacity, 6,000 per day.



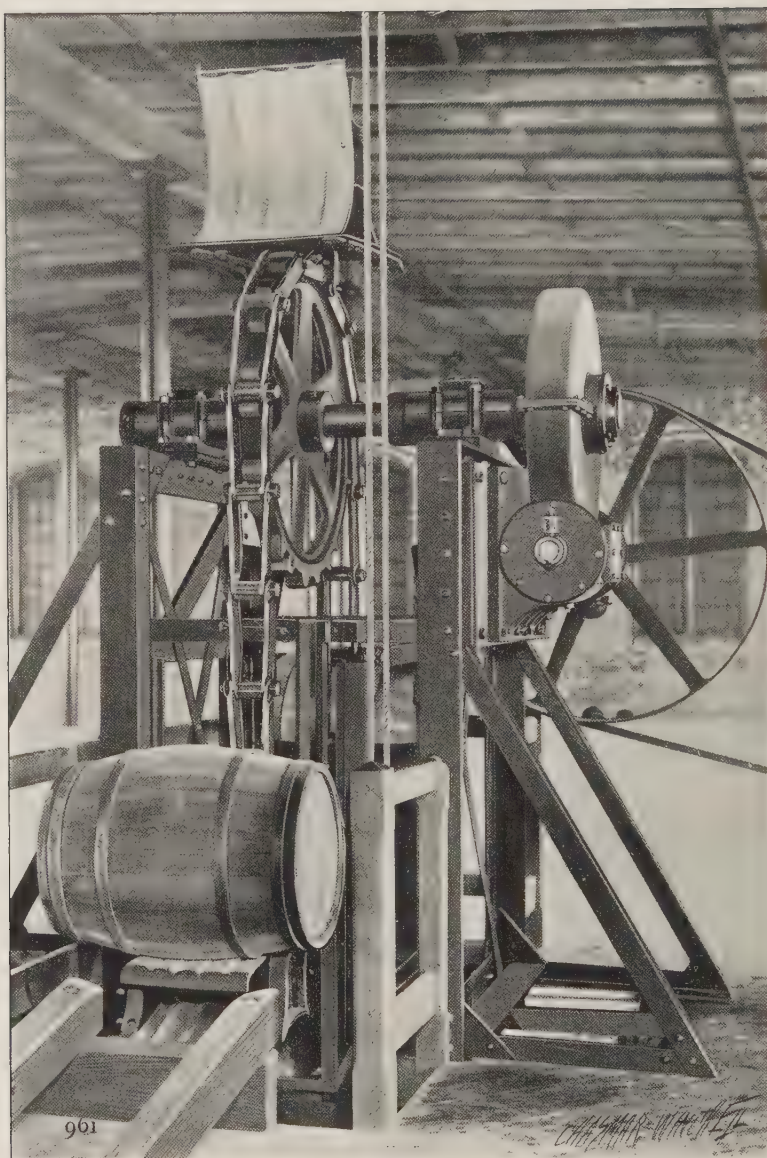
ELEVATOR FOR BARRELS, CASKS AND MISCELLANEOUS FREIGHT

In warehouse of Chicago, Milwaukee & St. Paul Railway, Chicago
Centrally hung freight carriers. Automatic delivery on slotted platform
after passing overhead. Capacity, 600 barrels per hour.



AUTOMATIC CONTACT DISCHARGE BARREL ELEVATOR WITH CAM BOOSTER

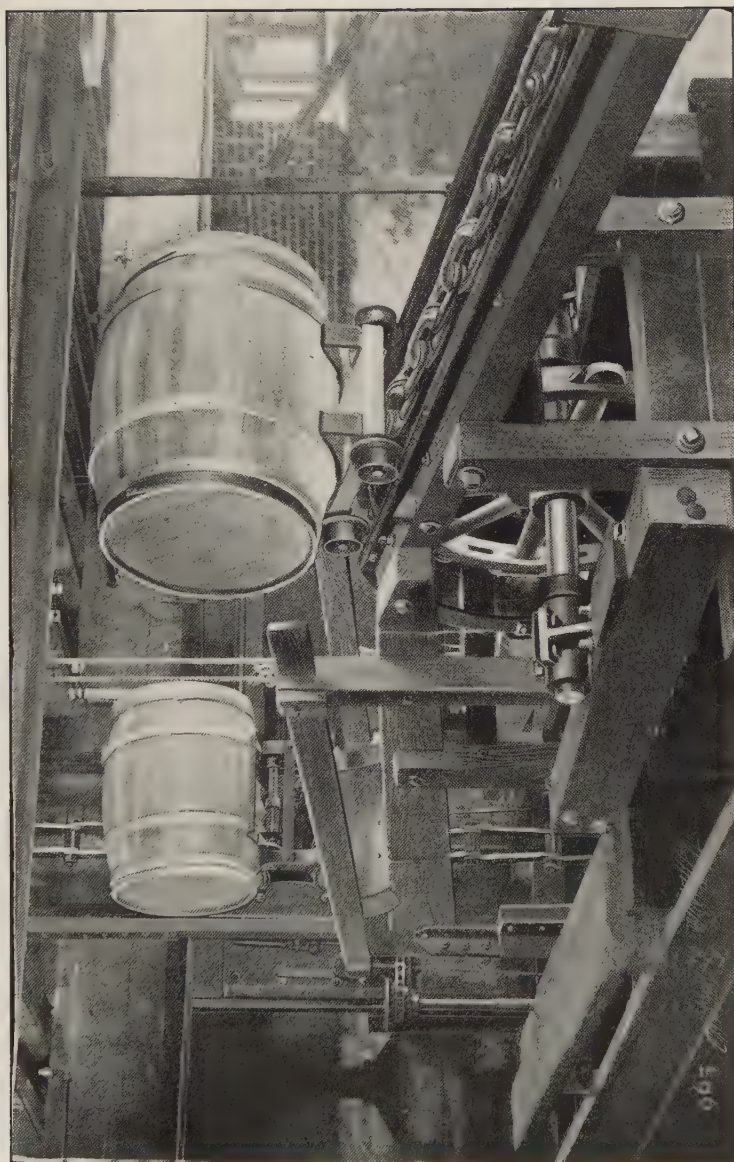
Cradles centrally and rigidly attached to Link-Belts.



70-FOOT BARREL ELEVATOR

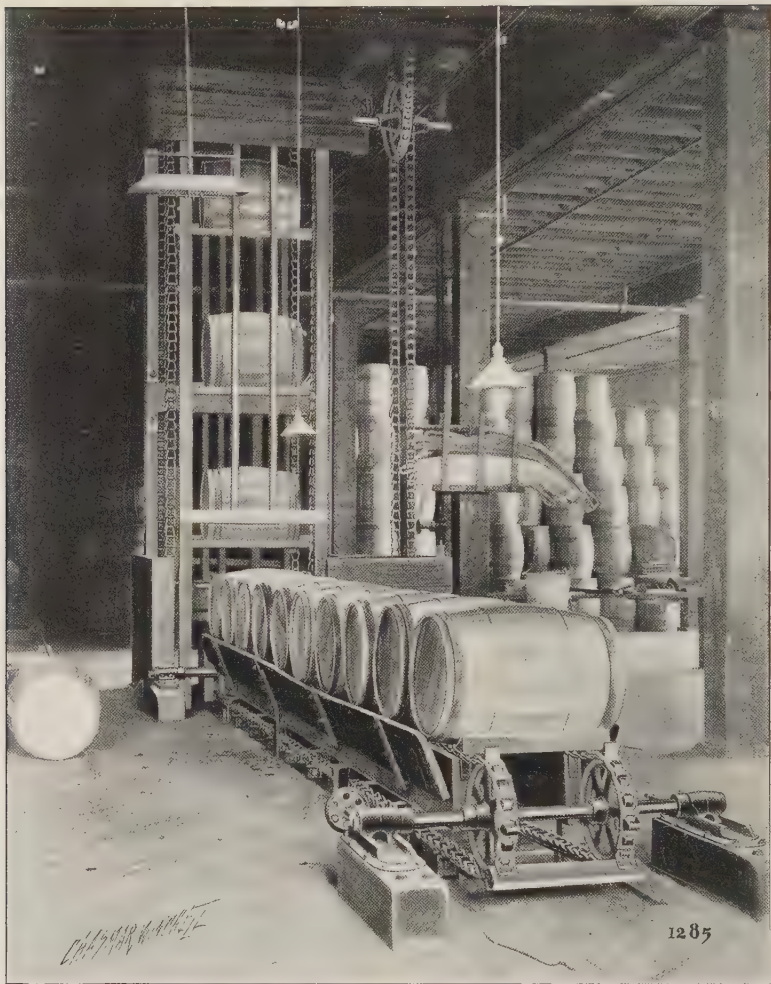
In McCahan's Sugar Refinery, Philadelphia, Pa.

Self-discharging arms, bushed chain, housed worm gearing.

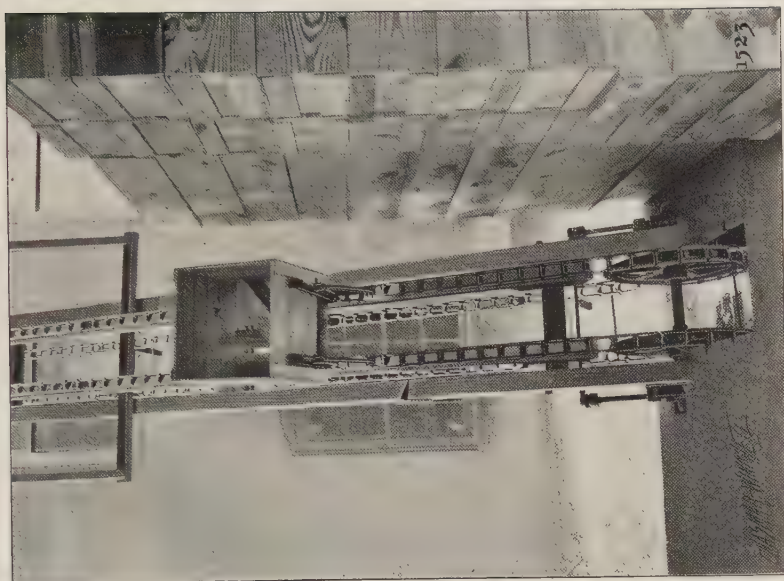


100-FOOT BARREL CONVEYOR

Delivering to 70-foot elevator in McCahan's Sugar Refinery, Philadelphia, Pa.
Roller trucks on Dodge chain, spaced to correspond with carriers on elevator



SELF-FEEDING BARREL ELEVATOR
Brooklyn Cooperage Co., Brooklyn, N. Y.
Capacity, 8 barrels per minute.



BOX ELEVATOR

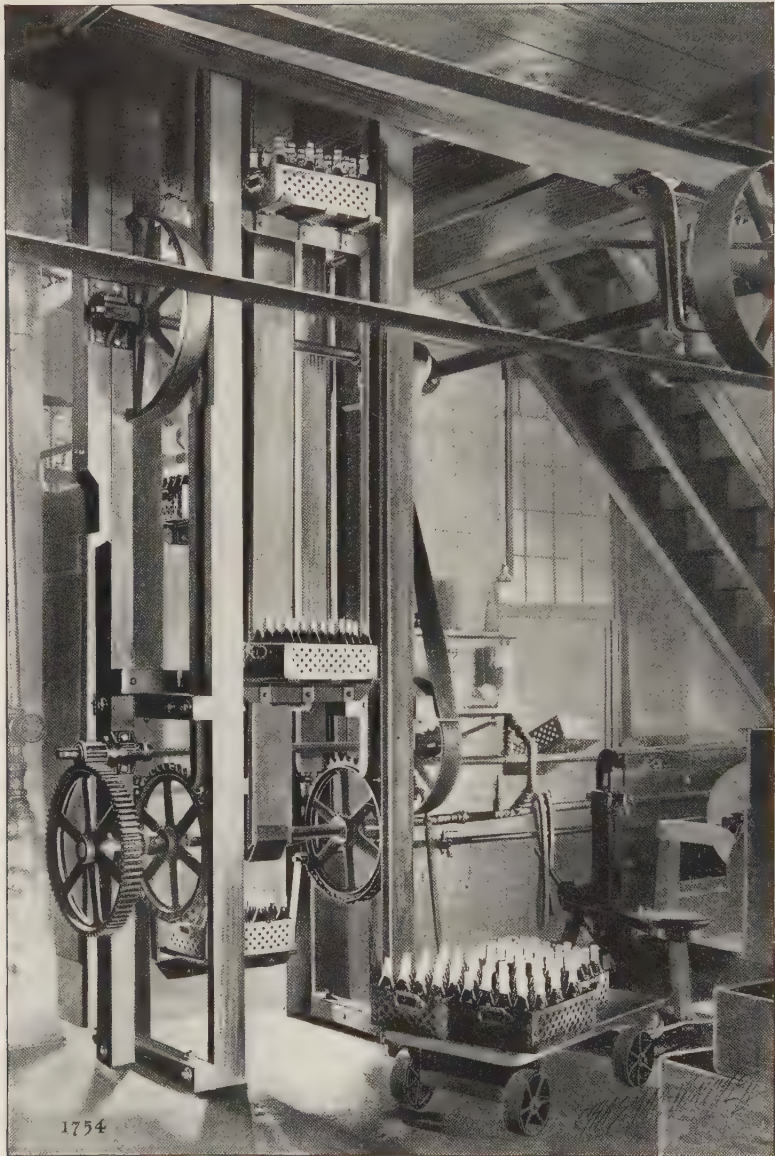
Scott Paper Co., 7th and Glenwood Avenue, Philadelphia, Pa.



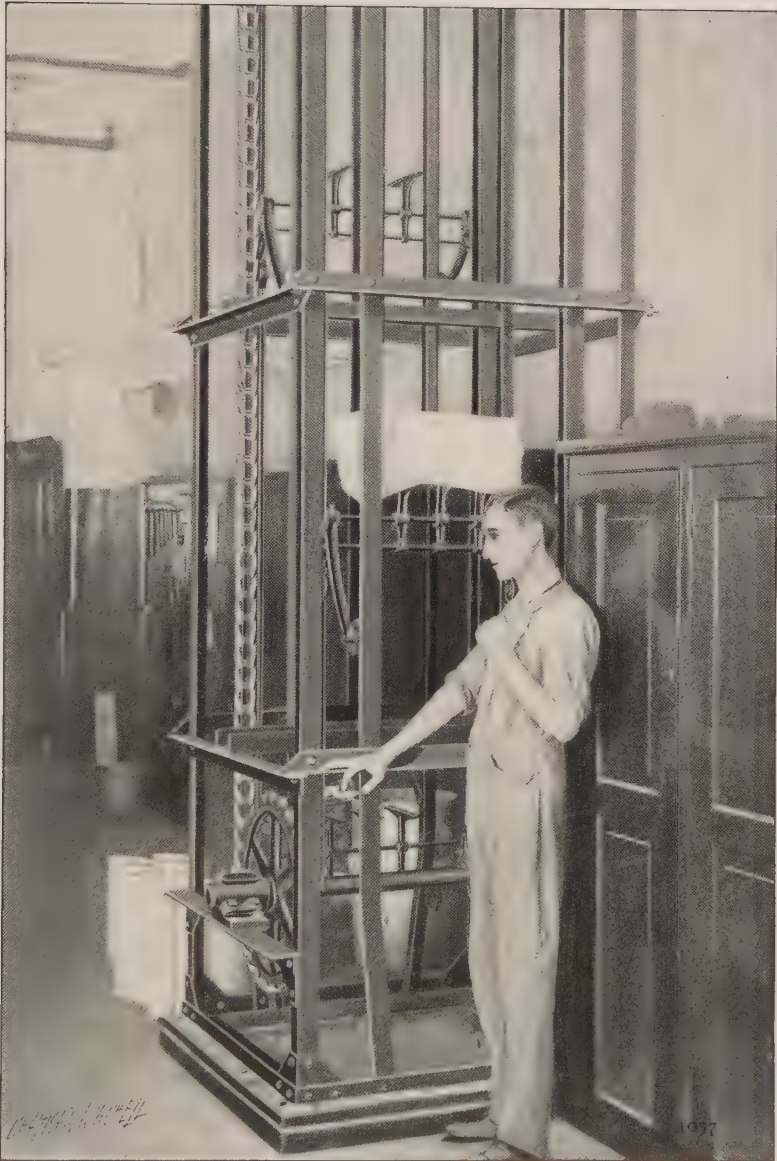
SOAP-BOX CONVEYOR

Colgate & Co., Jersey City, N. J.

Transfers boxes from one building to another; distance 80 feet.

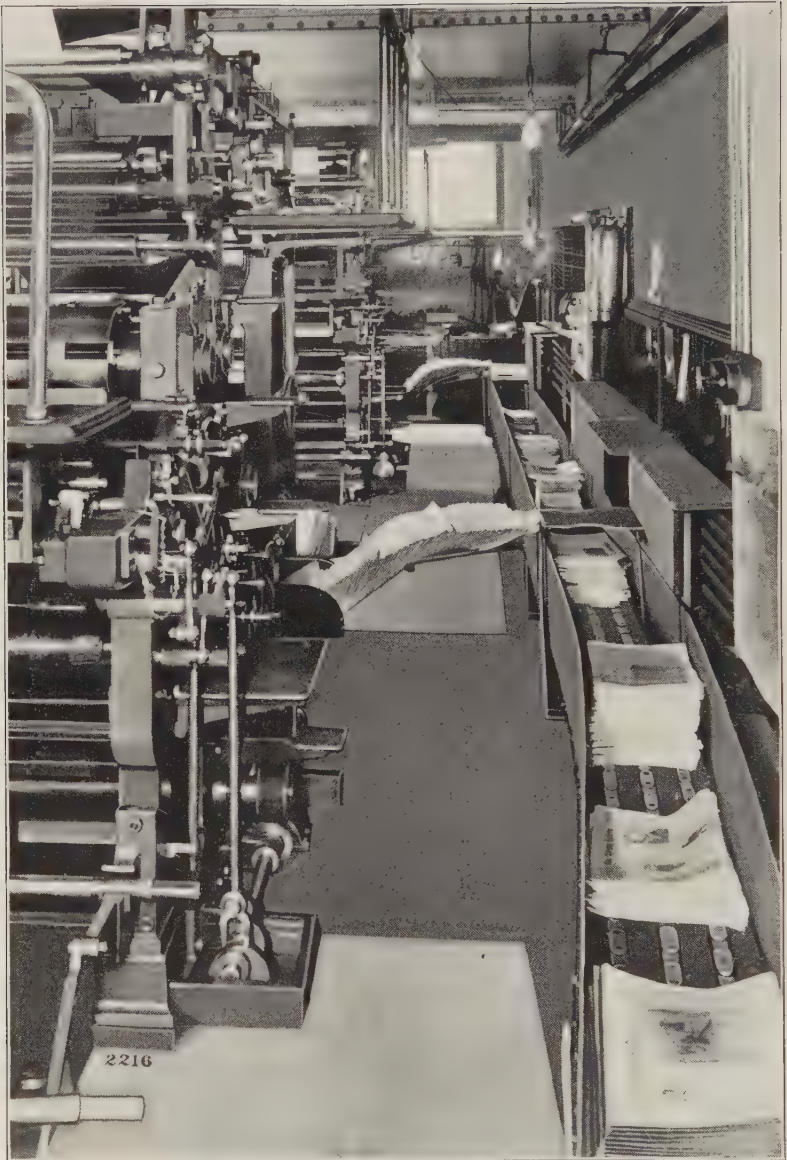


TRAY ELEVATOR FOR BOTTLED BEER CASES
Arnolt & Schaefer Brewing Co., Philadelphia, Pa.
Capacity, 240 cases per hour.



NEWSPAPER ELEVATOR

Elevates papers, carries them horizontally overhead and automatically deposits the bundles on delivery table, second floor. *Evening Telegraph*, Philadelphia, Pa.



170-FOOT NEWSPAPER CONVEYOR

Installed 1902 for the Bulletin Company, Philadelphia. Takes 16-page papers from seven presses and delivers to Distributing Department at the rate of 48,000 an hour; 20-page papers at the rate of 24,000 an hour.



MACHINE FOR LOWERING SIDES OF BEEF FROM SLAUGHTER ROOM
TO REFRIGERATOR ON FLOOR BELOW

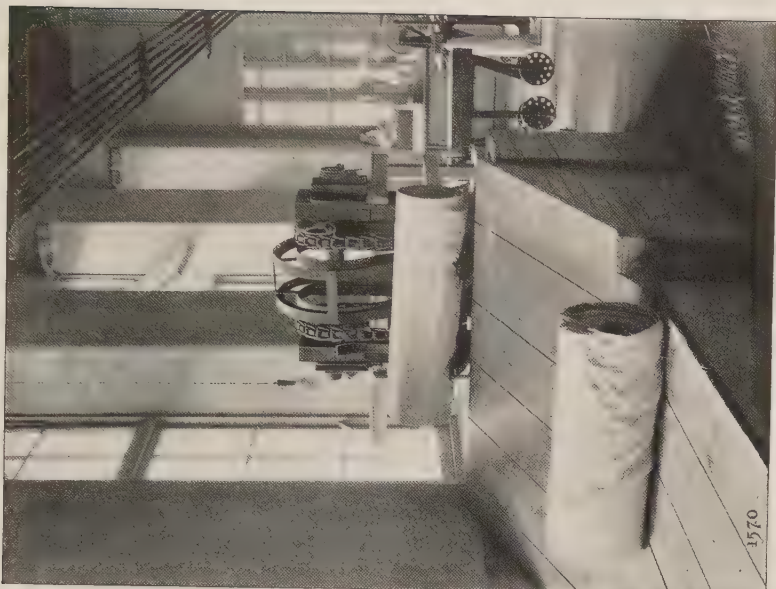
Wm. Burk & Brother's Packing House, Philadelphia, Pa.



288-FOOT REVERSIBLE CARRIER

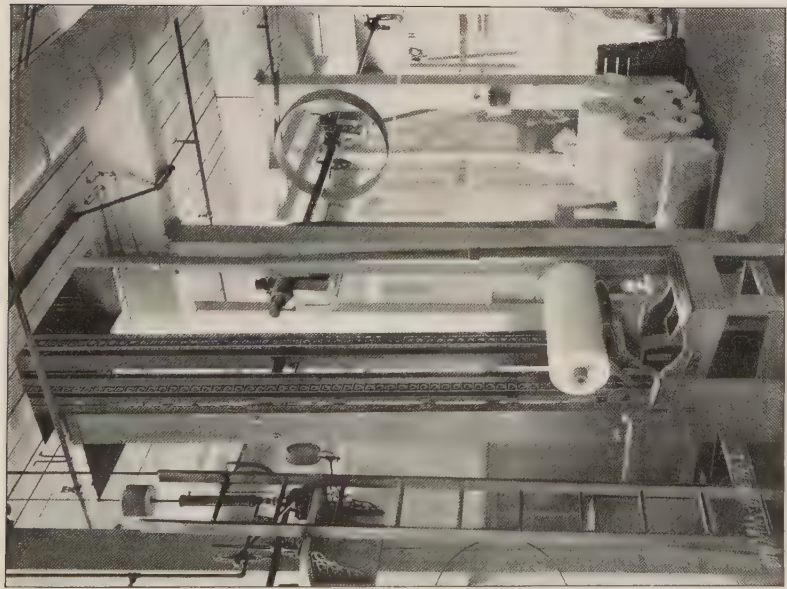
For handling 300-pound rolls between wharf and factory of the Mica Roofing Co.,
Brooklyn, N. Y.

A series of 4-wheel trucks attached to an endless chain. Efficient and economical of power.
Capacity, 300 rolls per hour.



HEAD OF CLOTH ROLL ELEVATOR

Joseph Bancroft & Sons, Wilmington, Del.
Showing automatic discharge on lifting side.



FOOT OF CLOTH ROLL ELEVATOR

Joseph Bancroft & Sons, Wilmington, Del.



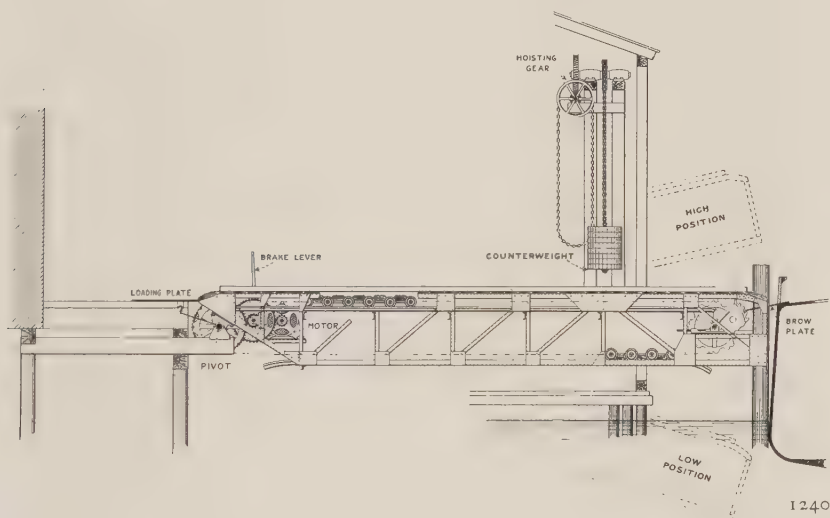
CARRIER OR RAMP FOR LOADING OR UNLOADING VESSELS

At Northern Steamship Company's wharf, Buffalo, N. Y.

Carrier or Ramp

For Loading or Unloading Vessels

The carrier consists of an endless traveling platform, upon which the men walk with their loaded trucks and are carried up the incline into the warehouse. The return trip with empty trucks is made over the stationary part of the gangway. The entire structure is pivoted at the inboard end, and is raised or lowered to suit the varying heights of vessels and tides. As the traveling platform is designed to



hold the trucks securely in place during the ascent, no additional labor is required to unload a vessel whose ports are considerably below the deck of the pier; and as the carrier is reversible, it can also be used for loading the vessel when the ports stand above the pier. A small electric motor supplies the required power. A large number of these ramps have been installed at other points.



TWO 136-FOOT CENTRES RAMP
Installed 1903 for The Arlington Mills, Lawrence, Mass.

The machines are carried by steel truss, and are employed for conveying wool trucks from one building to another.

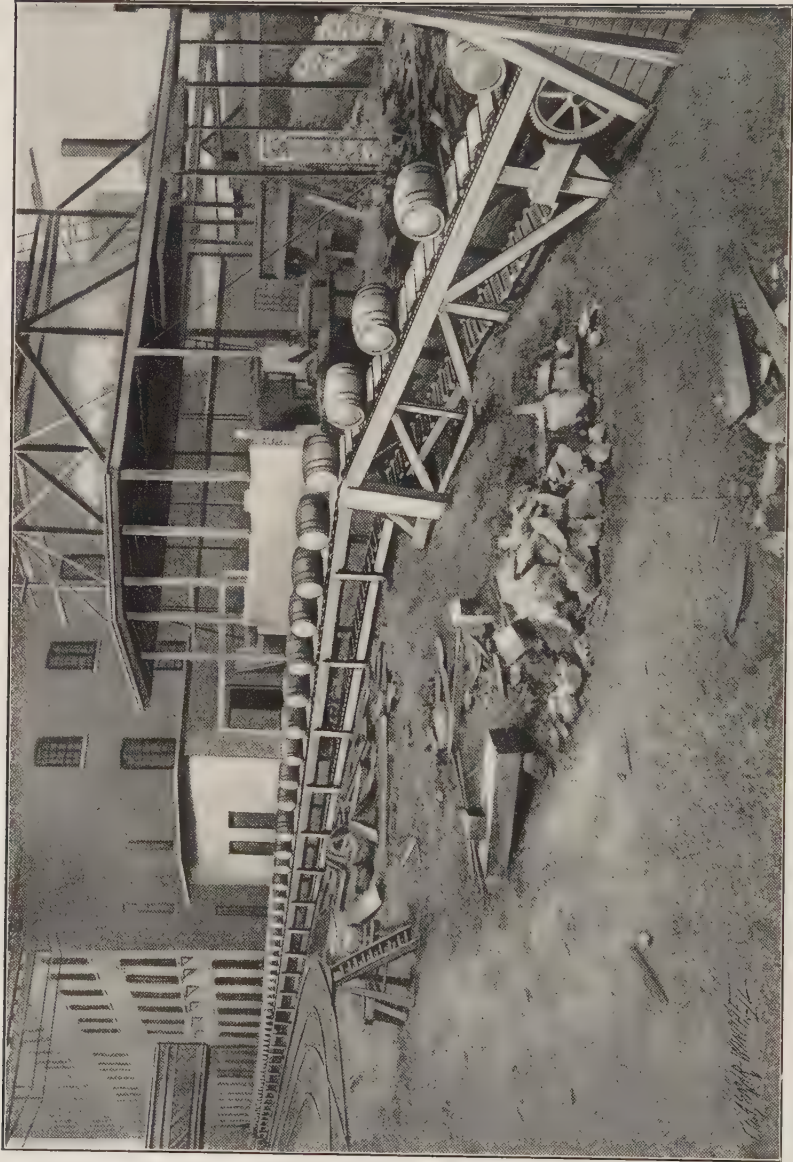


ONE OF TWO PAIRS OF ENDLESS FREIGHT CARRIERS

At Algiers wharf of Southern Pacific Company, New Orleans, La. View looking from vessel into wharf

"Our Mr. Morse has made a careful estimate of the saving in labor made by these elevators and puts it at \$48 per day, these figures agreeing quite closely with the estimate made by your company to the effect that we could easily save the price of the elevators in one year."

—Report from him, J. K. Krampton, General Manager Southern Pacific Co.



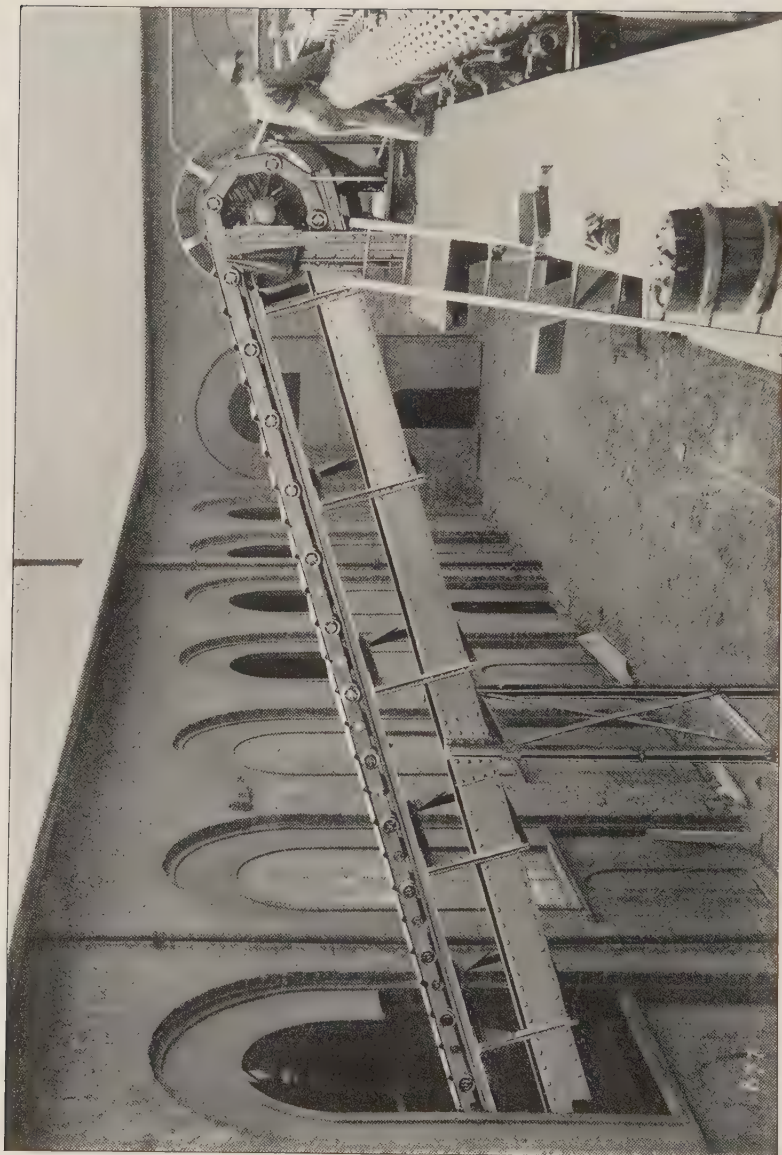
ENDLESS FREIGHT CARRIER

Designed and erected for the Glucose Sugar Refining Co., Taylor-Street Bridge, Chicago
Length, 435 feet. Adjustable end has rise and fall of 16 feet. View shows Carrier running with 75 barrels weighing 700 pounds each.
Carrier also handles sacks.



227-FOOT FLASK CONVEYOR

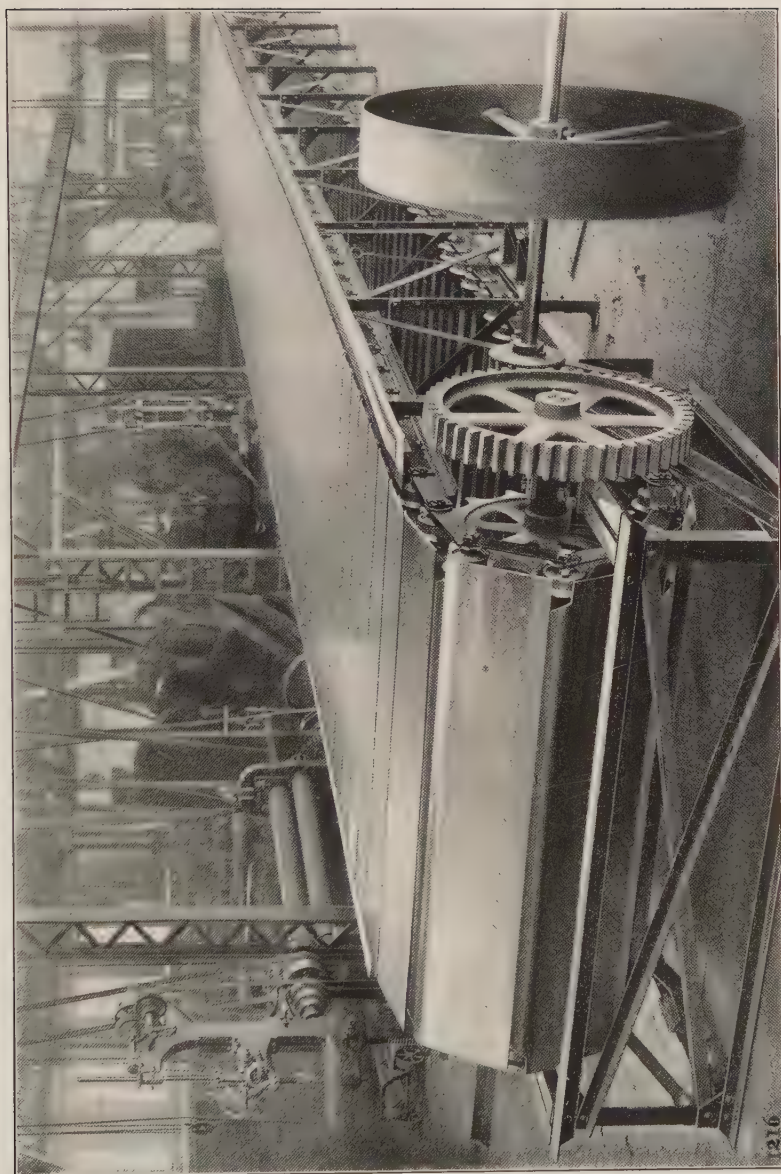
In the Westinghouse Air Brake Co.'s foundry, Wilmerding, Pa.
An essential part of the continuous moulding system. Carries green sand moulds
without jarring.



BILLET CONVEYOR

Bethlehem Steel Works, Bethlehem, Pa.

Receives billets from shears and delivers them to live rolls for distribution.

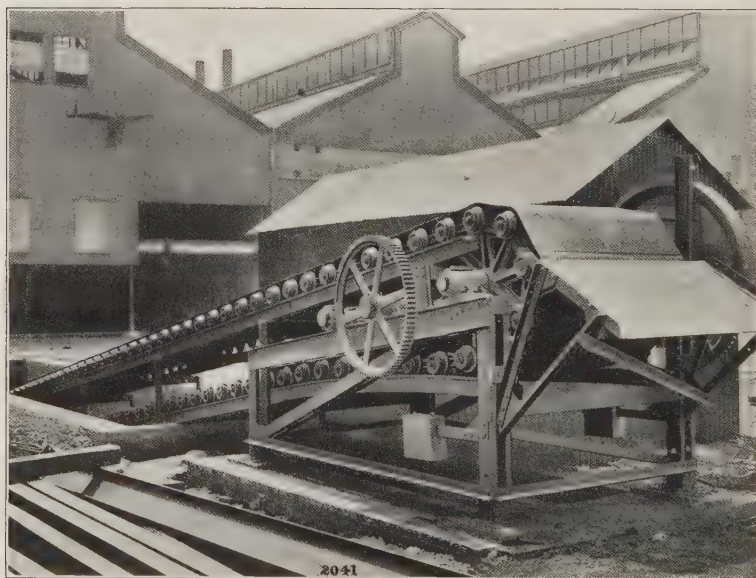


STEEL APRON CONVEYOR
See page 142 for description

Steel Apron Conveyor

The view on page 141, shows a steel apron conveyor built by us for the Morgan Construction Company, for installation in the Union Iron & Steel Company's Hoop Mill, Youngstown, Ohio. The conveyor is built of heavy, overlapping steel plates, substantially braced and secured to two strands of special chain. It is carried on self-lubricating rollers. This form of conveyor is extensively used as a picking table in anthracite coal breakers and as a carrier for wire bundles, hoop-iron or billets in steel mills. It is usually mounted on a self-contained steel frame and can be furnished of any length or width.

The photograph was made in our works before shipment.



221-FOOT CENTRES STEEL APRON CONVEYOR

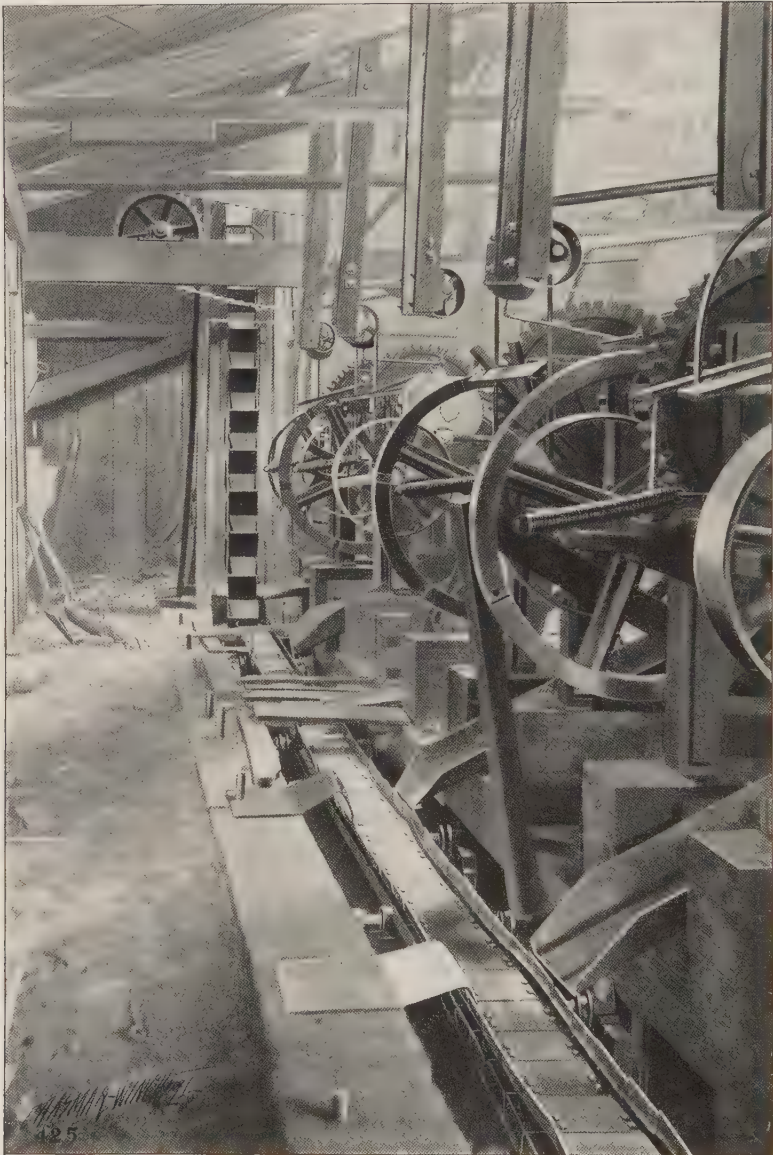
Installed for the Union Steel Company, Donora, Pa.

For handling bundles of steel rods.



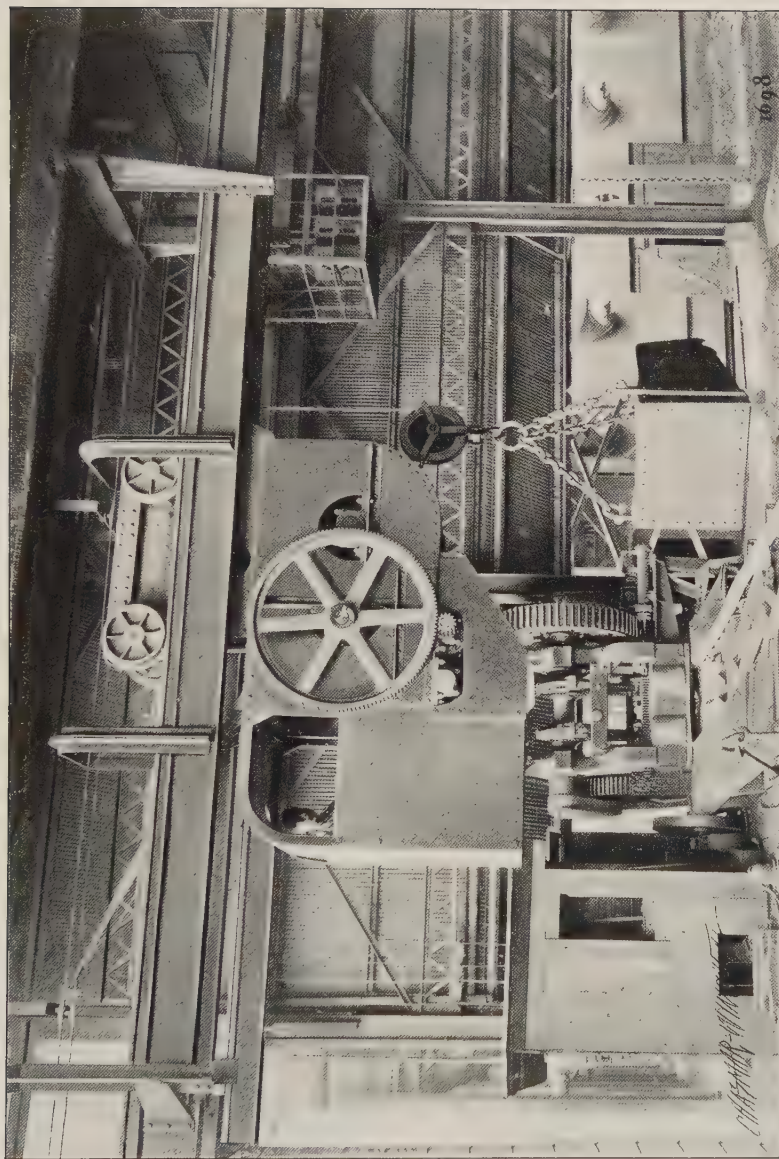
PLATFORM CONVEYOR

Electric Storage Battery Co., Philadelphia, Pa. Carries hot zinc plates from moulds to saws.



ENDLESS TROUGH CONVEYOR AND LINK-BELT ELEVATOR
FOR HANDLING HOT SPIKES

This type of conveyor is also suitable for handling scale in rolling mills.



CHAMBERLAIN PATENT ELECTRIC HOIST AND CONVEYOR

See description on page 146.

The Chamberlain Patent Electric Hoist and Conveyor

See illustration on page 145

A self-contained machine for lifting and carrying material to any distance for which tracks are provided.

Arranged to pass around curves of short radius and over interlocking switches thrown by operator.

The machine consists of a steel cage containing the hoisting and motive machinery and operator, suspended from and running on overhead tracks.

The cage is designed to completely enclose and protect the electric motor, hoisting and traveling machinery and operator.

The machine is operated by an electric motor of sufficient capacity to hoist and trolley the load simultaneously, and is connected by suitable gearing and friction clutches to the hoisting drums and track wheels.

It can be built for any desired load and speed of operation.

The sizes already in *use* are from one to five tons capacity with hoisting speed of forty and trolley speed on the overhead tracks of six hundred feet per minute.

The machine may be equipped with self-filling or drop bottom buckets for handling loose materials, or with slings for bags, barrels and other packages.

Transmission of Power by Manila Rope

The advantages of transmitting power by Manila rope are now so well known, and there are so many rope drives in daily operation throughout the country, that we will not attempt in this book an exhaustive treatise upon the subject. The views which are here presented, however, show many of its common applications.

We have had an extensive experience in the designing and installation of this class of machinery, having erected rope drives capable of transmitting from 1 to 1,500 horse power. We cannot too strongly emphasize the fact that the designing of rope transmissions requires special skill and knowledge obtained only by long experience. Failure to recognize this fact has proved costly to many concerns and done much to cause unwarranted prejudice against this means of transmitting power.

We are prepared to make *plans and estimates* for furnishing and erecting machinery to transmit any required power ; or, if preferred, will supply skilled superintendence and working drawings for the installation of our machinery.

In writing for information, please give the following particulars :

Relative positions of shafts. (a) Angle.

(b) Distance between points of application of power.

Speed and direction of rotation of each shaft.

Diameters of shafts.

Maximum horse power required.

Largest diameter of sheave that can be used.

Position and nature of any obstructions around which the rope must be guided.

Where clutches will be required, and whether a jaw or friction clutch should be used.

A rough sketch will greatly assist us.

Where power to be transmitted is considerable or location difficult, we will send one of our engineers to look over the ground and take the necessary measurements.

Sheaves

Our sheaves are thoroughly well made and accurately turned. We guarantee absolute uniformity of pitch diameter of the different grooves of same sheave, which is an essential feature in a perfect running rope transmission. The grooves are polished to prevent wear of rope.

While we do not advise using sheaves which are less than 40 times the diameter of the rope used, we can furnish sheaves of diameters from 24 inches up in steps of 2 inches, provided with any number of grooves, and properly proportioned to suit the different sizes of ropes.

Horse Power of Manila Ropes.

The Diameter of all Working-Sheaves should be at least 40 times that of the Rope.

Idlers may be 30 times the Diameter of the Rope.

Dia of Rope	Dia of Rope	Breaking Strain	Working Strain	1000 ft. pm.		1500 ft. pm.		2000 ft. pm.		2500 ft. pm.		3000 ft. pm.		3500 ft. pm.		4000 ft. pm.		4500 ft. pm.		5000 ft. pm.	
				H.P.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.	HP.	Tens. Wt.
5/16"	0.15	4000	121	2.25	90	3.38	90	4.50	90	5.37	85	6.25	80	6.88	80	7.50	80	8.00	75	8.50	70
3/8"	0.18	5000	151	2.75	110	4.13	110	5.50	110	6.62	105	7.75	100	8.75	100	9.75	100	10.25	95	10.75	90
7/16"	0.27	7500	227	4.25	170	6.25	170	8.25	170	10.00	165	11.75	160	13.13	155	14.50	150	15.25	140	16.00	130
1"	0.33	9000	272	5.00	200	7.50	200	10.00	200	12.00	190	14.00	180	15.62	175	17.25	170	18.12	160	19.00	150
1 1/8"	0.45	12250	371	7.00	280	10.25	275	13.50	270	16.25	260	19.00	250	21.25	240	23.50	230	24.75	220	26.00	210
1 1/4"	0.50	14000	424	8.00	320	11.75	315	15.50	310	18.75	300	22.00	290	24.50	280	27.00	270	28.25	255	29.50	240
1 3/8"	0.65	18062	547	10.25	410	15.13	405	20.00	400	24.12	385	28.25	370	31.50	360	34.75	350	36.62	330	38.50	310
1 1/2"	0.73	20250	613	11.50	460	16.75	450	22.00	440	26.75	430	31.50	420	35.25	405	39.00	390	41.25	370	43.50	350
1 3/4"	0.82	25000	760	14.25	570	21.00	560	27.75	550	33.62	535	39.50	520	44.25	505	49.00	490	52.25	470	55.50	450
1 7/8"	1.08	30250	916	17.00	680	25.25	670	33.50	660	40.38	645	47.25	630	52.75	605	58.25	580	61.50	550	64.75	520
2"	1.27	36000	1000	20.50	810	30.25	800	40.00	790	48.25	765	56.50	740	62.87	705	69.25	670	73.37	645	77.50	620

The Red Thread Brand of Tallow Laid Manila Transmission Rope

is manufactured exclusively for us by the best rope-makers in the country. It is made of selected long fiber, and is the rope we adopted after a series of unprejudiced tests which we made of all the best ropes obtainable in this country and Europe. Its first cost is greater than that of the ordinary Manila rope, which our experience has shown to be not sufficiently durable for this class of work.

We carry a stock of all sizes and can make prompt shipment.

In order to obtain the best results we would caution all users of rope to run it onto the sheaves without kink or twist before splicing. We indicate by tags how to place the coil, and at which end to commence drawing it out or uncoiling it.

Prices upon application.

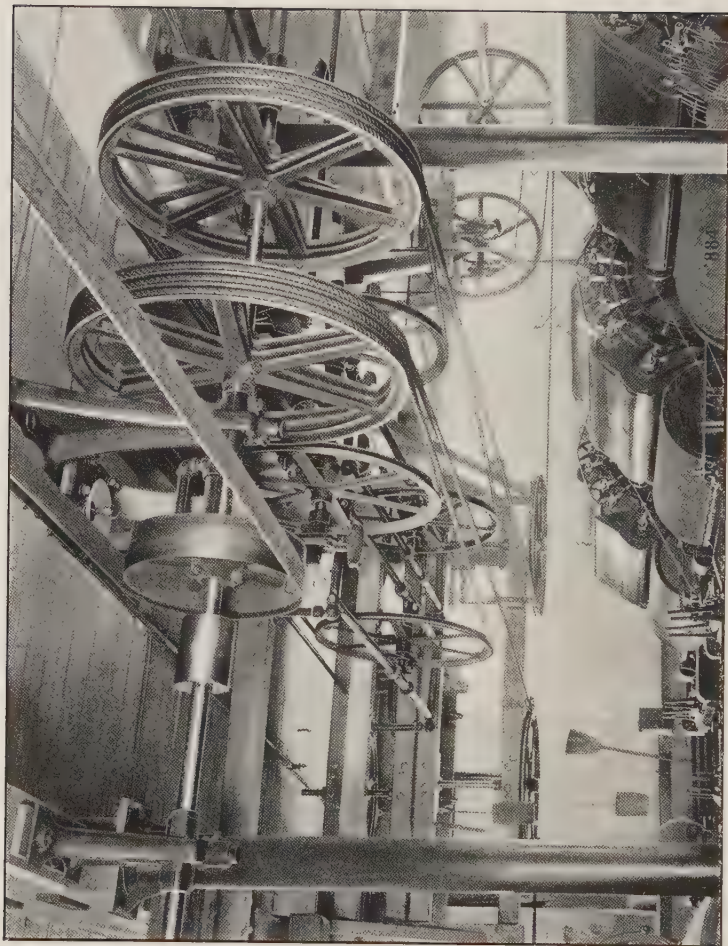


Link-Belt Rope Dressing

keeps the rope soft and pliable, protects it from external and internal friction, heat and moisture. Especially desirable for out-of-door drives. It is moulded into sticks of five pounds each, of convenient form and easily applied.

Price, \$2.50

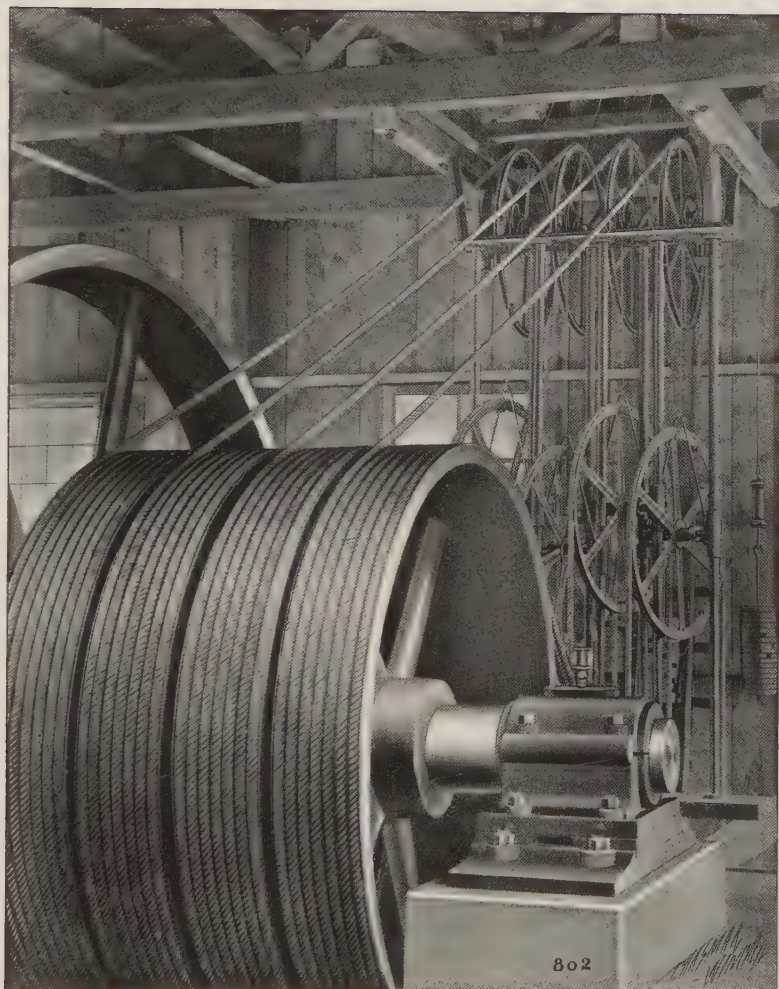




TWO 20-HORSE POWER ROPE DRIVES

In mill of W. H. Grundy & Co., Bristol, Pa.

Erected 1893. 1 $\frac{1}{2}$ -inch rope. Driven shafts at right angles to driver. Re-winding sheaves used to give additional adhesion.



500-HORSE POWER ROPE DRIVE

American Axe & Tool Co., Beaver Falls, Pa.

From engine to jack-shaft in four separate drives, each with its own tension carriage and having seven strands of $1\frac{7}{8}$ -inch rope. Driven sheave 96 inches in diameter, 32 grooves.

Electric Motors as a Source of Power for Elevators and Conveyors

See pages 153 and 154 for illustrations of Electric Motor Transmissions.

Electric motors are extensively used by us for driving elevators and conveyors, and the largest installations made during the last year are so equipped.

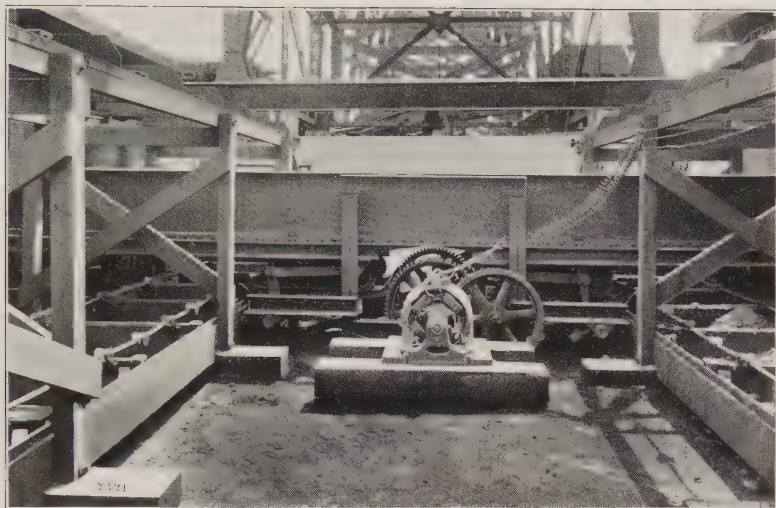
They materially simplify the problem of transmitting power to the various widely separated elements of an elevating and conveying plant, and save both power and repairs of the driving machinery.

The readiness with which a motor can be applied to a machine makes it possible for the engineer to so divide the plant into elements as will permit him to use the best form of apparatus for each function and to so place the various units, or elements, with relation to each other as to secure the highest degree of efficiency. With a power plant centrally located, such a separation of a plant into units usually so complicates the problem of power transmission as to make its solution open to the objection of excessive multiplication of parts.

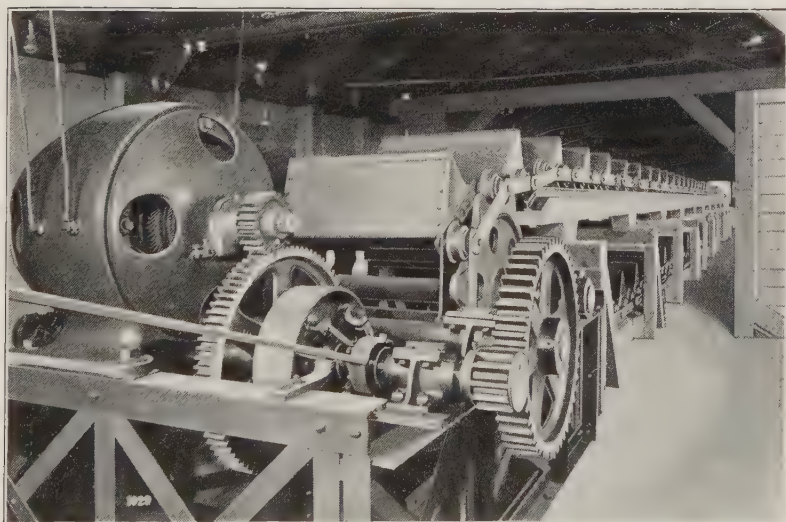
In determining the size of the motor to operate the various types of machines manufactured by us, it must be borne in mind that the motor may be called upon to start the apparatus fully loaded from a state of rest.

The character of winding depends on the class of machine and the kind of duty it is called upon to perform.

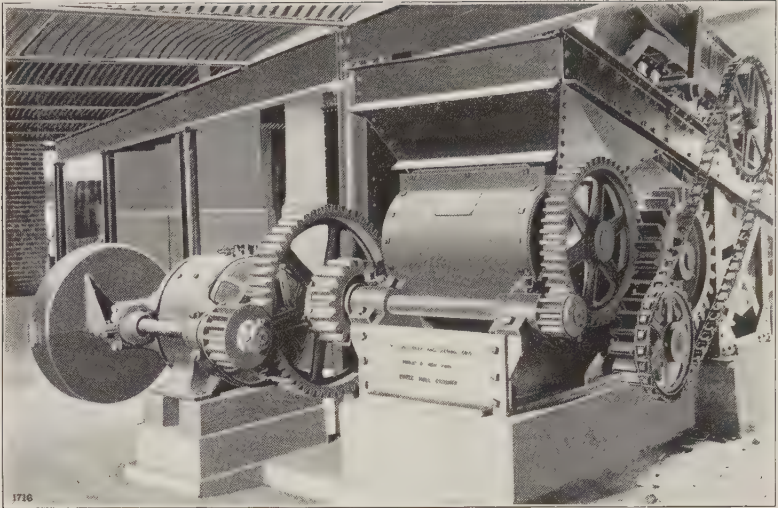
We gladly place our experience at the service of our customers and will either give them the exact size of motor required or will furnish electrically driven machines for which our guarantee will cover the size and fitness of the motor to perform its work, as well as the mechanical efficiency, the capacity and the fitness of our machinery.



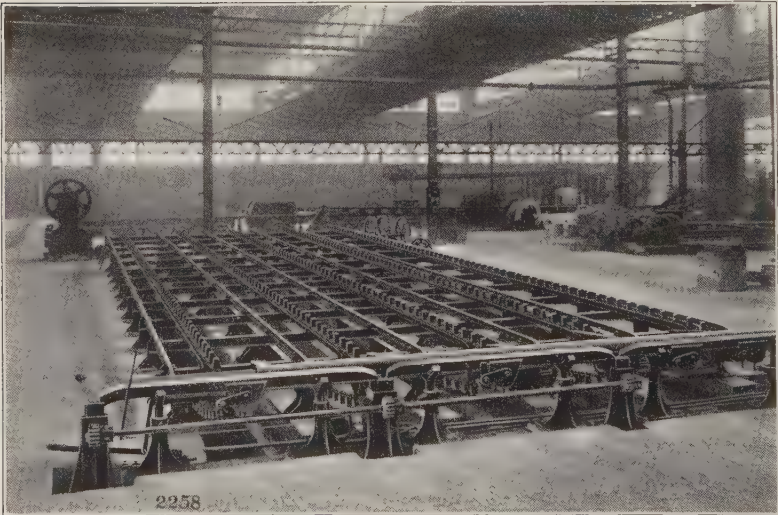
ELECTRIC MOTOR DRIVING A PAIR OF LINK-BELT RECIPROCATING
GATES FEEDING RUN-OF-MINE GAS COAL TO CONVEYORS



ELECTRIC MOTOR DRIVING COMBINED ELEVATOR AND CONVEYOR



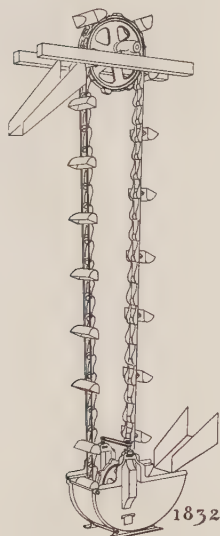
ELECTRIC MOTOR DRIVING COAL CRUSHER



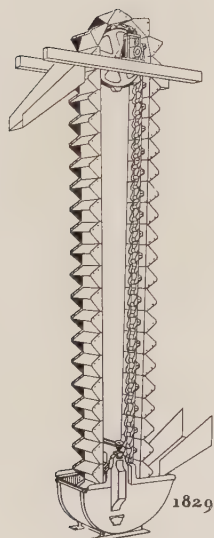
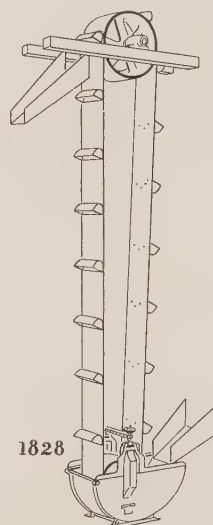
ELECTRIC MOTOR DRIVING MECHANISM OF A PIPE COOLING
BED

Elevators, Conveyors and Carriers

The following outline sketches show prominent types of Link-Belt and Chain appliances for handling materials as developed in the growth of our industry.

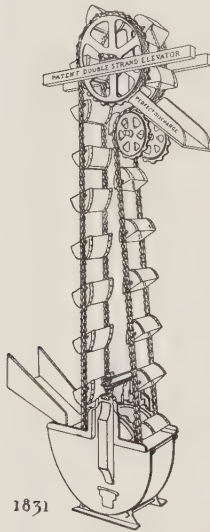


The oldest form of Link-Belt Elevator is the SINGLE STRAND CENTRIFUGAL DISCHARGE, consisting, in its essential parts, of two wheels and a chain (or flat belt) with buckets attached, and, having a wide range of usefulness, it is more extensively employed than any other.

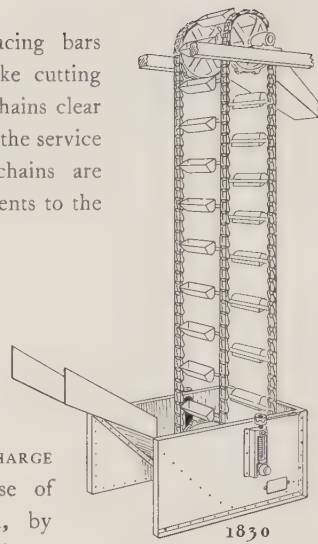


SINGLE STRAND CONTINUOUS BUCKET ELEVATORS are employed when frangible material is to be raised. In this type the face of each bucket, after passing over the head wheel, serves as a chute to direct the flow of the contents of the following bucket. Its capacity exceeds that of the Centrifugal type, and it runs at slower speeds.

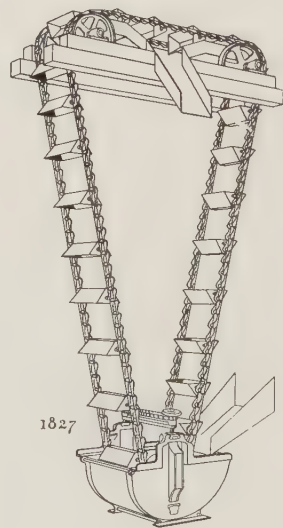
DOUBLE STRAND ELEVATORS with spacing bars are indicated for foundry or glass sand and like cutting substances. This construction keeps the chains clear of the material handled and greatly prolongs the service of the links. For other materials the chains are fastened either rigidly or by swivel attachments to the ends of buckets.



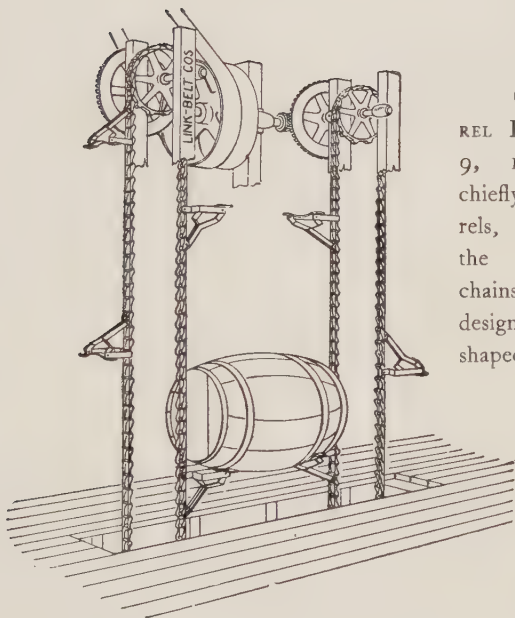
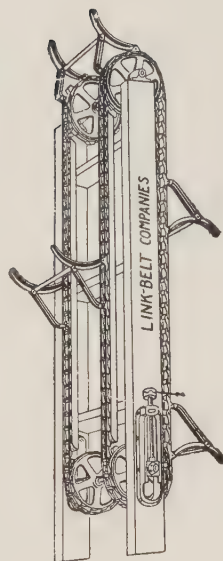
PERFECT DISCHARGE
ELEVATORS permit use of
spaced buckets, and, by
completely inverting them,
make clean delivery into chute at elevator head. They
are run at relatively slow speeds and have met with
much favor for handling breakable substances or
materials which tend to cling to the buckets.



THE GRAVITY DISCHARGE ELEVATOR (patented September 20, 1892) is an outgrowth of our experience in handling sized coal and has been found admirably adapted to that and similar work. The buckets are attached to the chains, as in the Perfect Discharge type, but instead of dropping the coal or other material after passing the head wheels, these buckets take the position of conveyor flights and move the material horizontally to any desired point of discharge. We build this type of elevator to lift any desired height and convey any desired distance of required capacities. See also illustrations on pages 83 and 84.

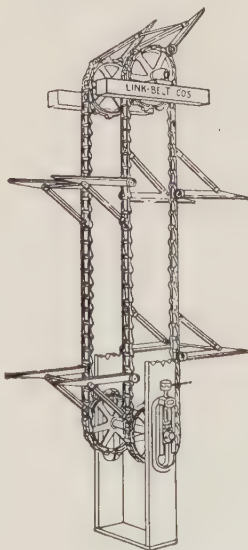


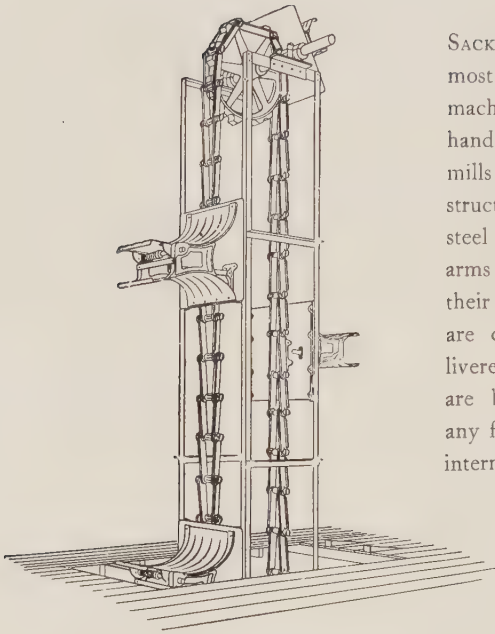
RIGID ARM BARREL AND KEG ELEVATOR, furnished complete with framing. Delivers over the head wheels. Extensively used in breweries and flour mills. Is strong, simple and cheap.



CONTACT DISCHARGE BARREL ELEVATOR (patented June 9, 1896). Designed and chiefly used for raising oil barrels, which are carried up by the cradles attached to the chains, and rolled off at the designated floor by a cam-shaped pusher.

STRAIGHT ARM PACKAGE ELEVATOR differs from the keg and barrel elevator only in the shape of the arms, which are designed to receive other than round packages. It is used for elevating or lowering hay and other materials in bales, shoe cases and boxes of merchandise.

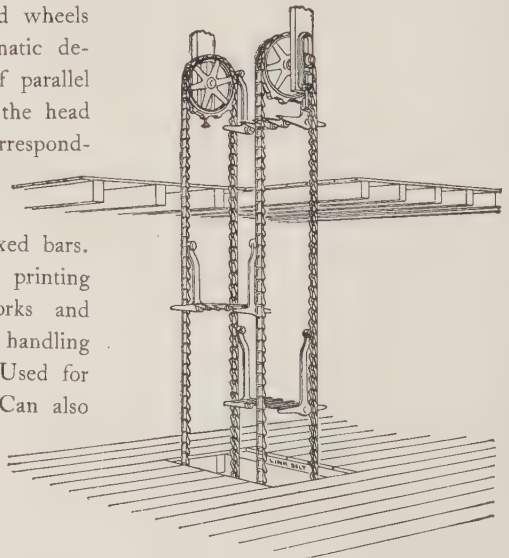


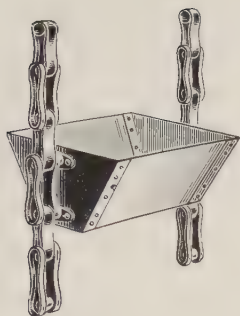


AUTOMATIC BARREL AND SACK ELEVATOR. This is the most complete and efficient machine ever offered for barrel handling in sugar refineries, flour mills and factories. The construction, including frame, is all steel and iron. The automatic arms are strong, and perfect in their action. Barrels or sacks are carried up and gently delivered on any floor while others are being carried down from any floor to the ground, or to intermediate floors.

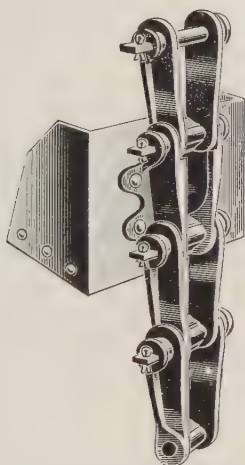
TRAY ELEVATORS. The carriers of this type are of various forms, but all are pivoted to the chains above the center of gravity of the load, and will carry it over the head wheels without jar. To secure automatic delivery the trays are formed of parallel bars, which, after passing over the head wheels, deposit their load on corresponding bars set to receive it, the fingers of the descending tray passing between the fixed bars.

Tray elevators are used in printing houses, ink factories, tile works and other establishments where gentle handling of light packages is called for. Used for both elevating and lowering. Can also be arranged to carry any distance horizontally.

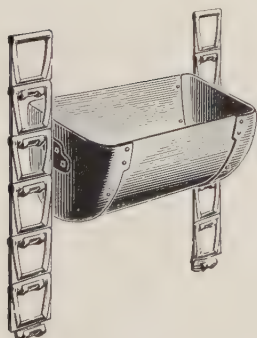




Gravity Discharge Elevator
Bucket on Tubular Chain



Open Front Bucket on Ley
Bushed Chain



Malleable End Bucket on
Ewart Link-Belt, for
Perfect Discharge Elevator

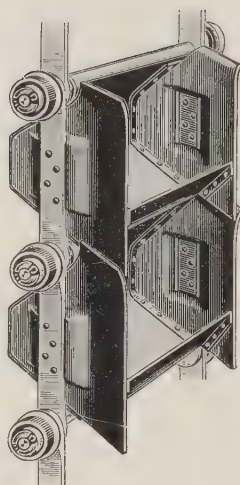
Bulk Elevators

We design and build elevators of any required capacity and to handle any bulk material.

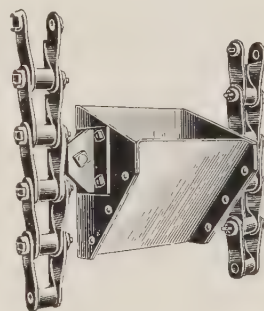
The use of detachable chains for this service originated with us, and with the co-operation of our customers we have developed forms to meet all conditions that have arisen.

The more important types are illustrated and described on pages 155, 156, 157 and 158.

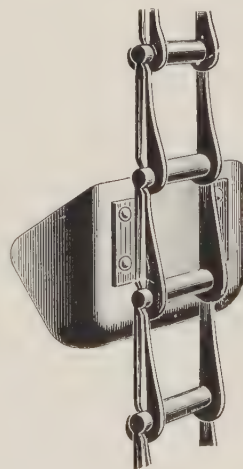
The chains employed in those elevators cover almost our entire line, and the buckets are of such size, shape, gauge and material as experience has proven best adapted to the conditions.



Overlapping Bucket
Elevator on Forged Steel
Chain with Rollers



Steel Bucket attached by
Swivel to
Two Strands of Chain



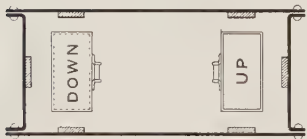
Malleable Iron Bucket on
Ewart Link-Belt

Steel Casings

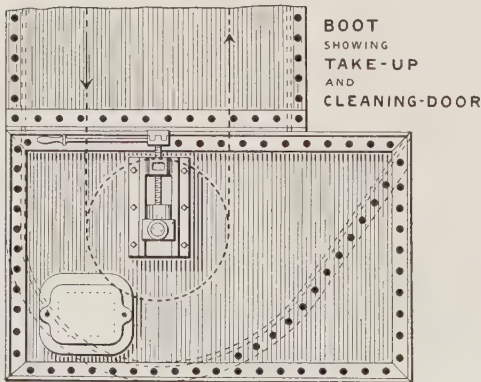
are used to an increasing extent, both indoor and out, as a safeguard against fire and a protection to the elevator. We have special facilities for this class of work, and build these casings in our own shops in sections of convenient length, accurately fitted to each other and to the boot, and made dust-tight when so required.



CROSS-SECTION
ANGLE IRON JOINTS & GUIDES



CROSS-SECTION
FLANGED JOINTS, FLAT IRON GUIDES



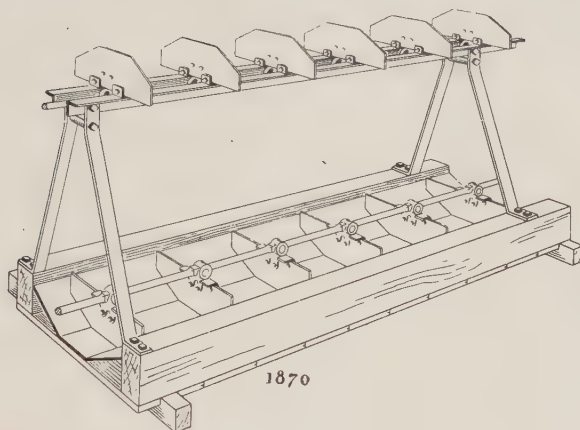
BOOT
SHOWING
TAKE-UP
AND
CLEANING-DOOR

1707

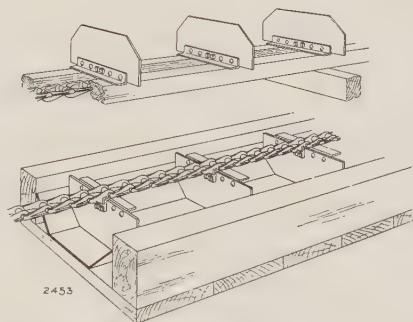
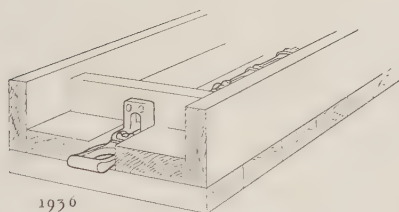


Standard Cast Iron Boot
and Steel Casing

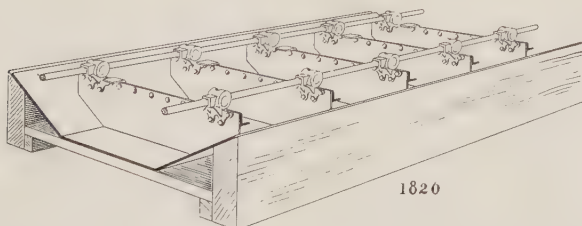
Conveyors



Simplicity and economy in cost characterize the SINGLE STRAND FLIGHT CONVEYOR, which is well adapted to coarse and granular substances and requires little attention or repair. More conveyors of this type are in use than of all others combined.



Single Strand Conveyors with WOODEN TROUGH AND FLIGHTS are used for carrying wood shavings, kindling wood, etc.

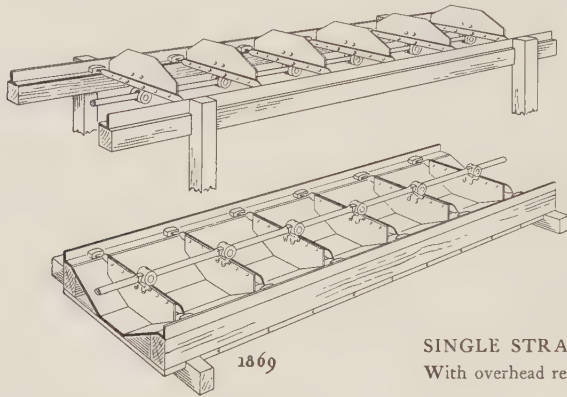


DOUBLE STRAND DRAG CONVEYORS are for rough-and-ready work in coarse materials, and are usually of very large capacity. We have built them to take thirteen tons of coal per minute from mine car into breaker.

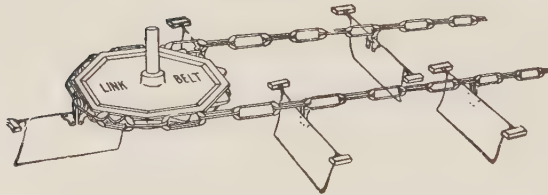
Noiseless Flight Conveyors

The great increase of steam generation in our closely built up cities, in power houses and in office buildings, has not only extended the use of fuel conveyors, but established the requirement that they be noiseless in operation. To meet this condition we designed the Suspended Flight Conveyor, which retains the economical advantages of the scraper, or flight, and yet runs without noise. We have installed many conveyors of this type, and all have been found noiseless and efficient.

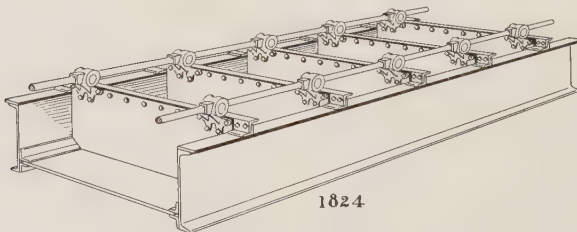
The NOISELESS SUSPENDED FLIGHT CONVEYOR is supplied in the three styles following :



SINGLE STRAND
With overhead return.

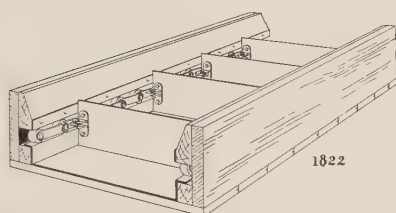
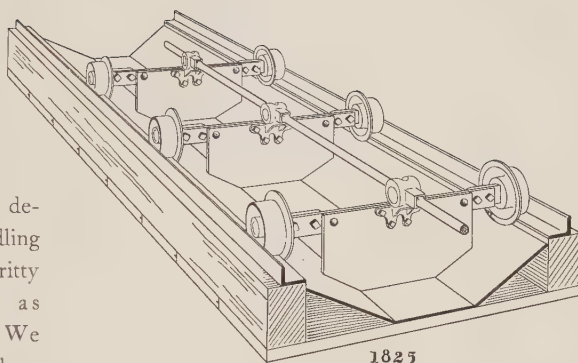


SINGLE STRAND HORIZONTAL
For conveying in two or more directions in same plane.



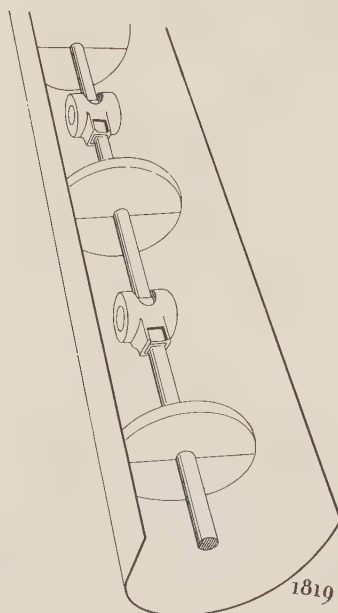
DOUBLE STRAND
With overhead return, used when very large capacity is required.

A modification of the SUSPENDED FLIGHT CONVEYOR substitutes rolling for sliding friction and has been found desirable for handling finely divided gritty materials, such as moulding sand. We have supplied these conveyors to foundries, glass factories and pulp mills.



Suspended Flight Conveyors on ROLLER CHAIN are used principally for handling large lump coal.

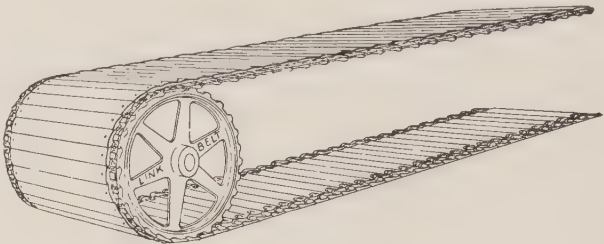
CIRCULAR FLIGHT CONVEYORS ON MONOBAR CHAIN are used for long conveyors of moderate capacity.



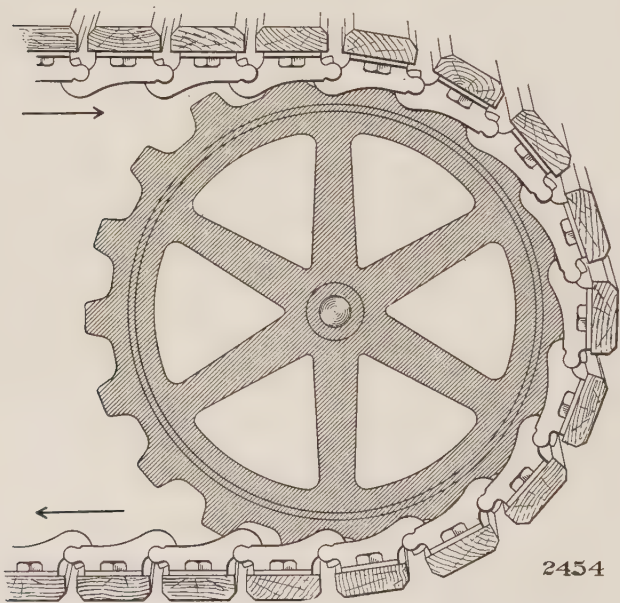
Carriers

Under this head, as distinguished from Bulk Elevators and Drag Conveyors, we classify the following:

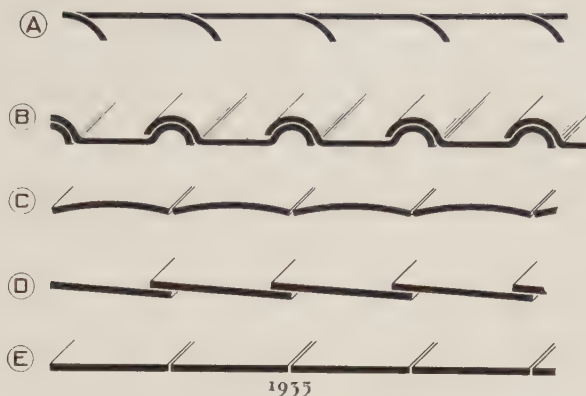
ENDLESS APRONS. These are made with either one or two strands of Link-Belt or other chain, to which plates or strips are attached, forming an unbroken surface. These



plates, if of steel, are either curved to the radius of the sprocket wheels, flat or corrugated. When made of wood they present the appearance of a traveling platform, or floor. Flanged rollers are added when heavy weights are to be moved. They are used for carrying sugar, clay and other bulk materials, steel billets, foundry flasks, cases of bottles and miscellaneous freight.



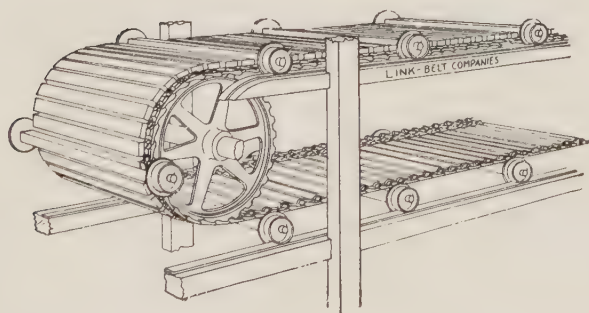
ENDLESS APRON WITH WOODEN SLATS, TOP EDGES CHAMFERED



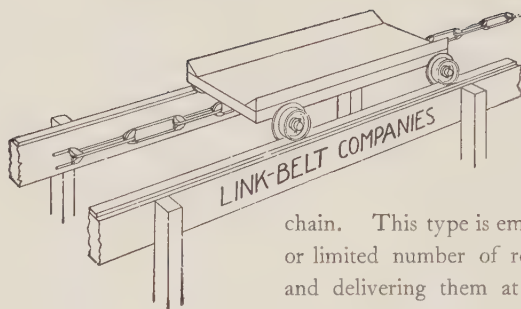
- A. Steel slat with curved edge.
- B. Overlapping corrugated steel slat.
- C. Curved steel slat.
- D. Overlapping straight steel slat.
- E. Straight steel slat.



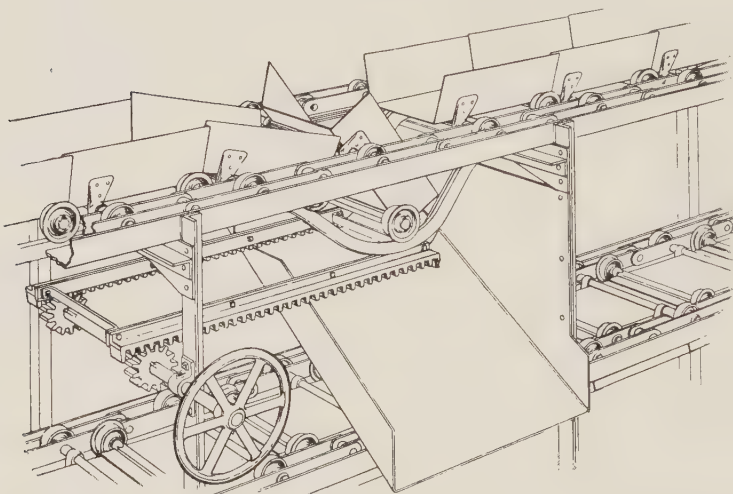
SECTION OF FREIGHT CARRIER OR RAMP



ROLLER SLAT CARRIERS are designed for cases or packages in canneries, soap factories and warehouses. The slats, or bars, which connect the chains, are usually of hard wood and form a traveling platform, which is supported at intervals by flanged rollers.



ROLL OR BARREL CARRIER. Consists of four-wheeled trucks running on light rails and attached at intervals to an endless chain. This type is employed to handle a fixed or limited number of rolls or barrels, receiving and delivering them at timed intervals. It is, of course, cheaper than a continuous carrier.

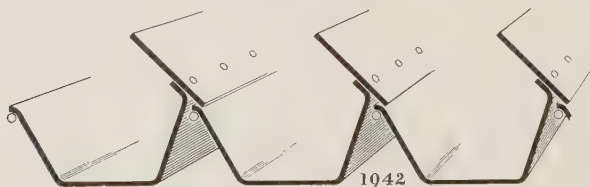
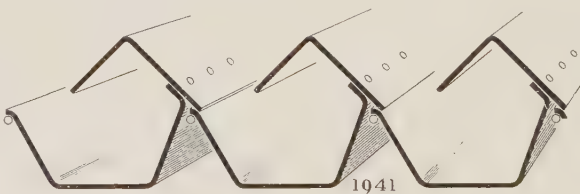


ENDLESS TROUGH CONVEYOR WITH HINGED PANS. Useful in handling gritty or lumpy materials where intermediate points of discharge are wanted.

LINK-BELT CARRIER BUCKETS

For other illustrations of Link-Belt Carriers see pages 58 to 72 inclusive.

For carrying on the lower, vertical and upper runs. Rigidly attached to long pitch roller chains.

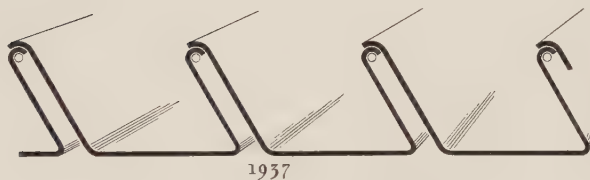


Open top, for carrying horizontally and then vertically. Buckets are attached to long pitch roller chains.



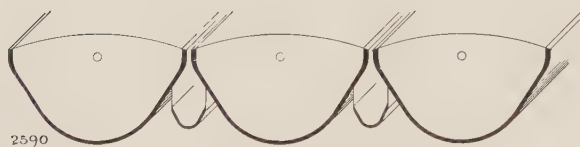
OVERLAPPING BUCKETS

Used for conveying horizontally or on an incline. Rigidly attached to long pitch roller chains.



OPEN TOP PITCH LINE BUCKETS

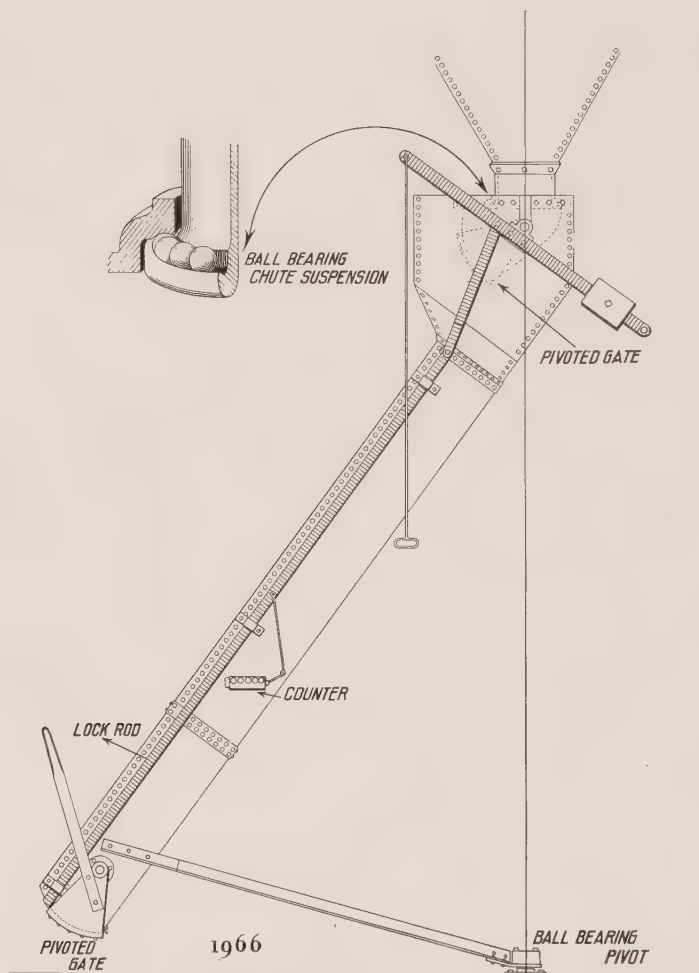
Used for carrying horizontally or on an incline. Rigidly attached to long pitch roller chains.



DODGE CONVEYOR BUCKETS

For description see pages 79, 80, 81 and 82.

Measuring and Distributing Spout



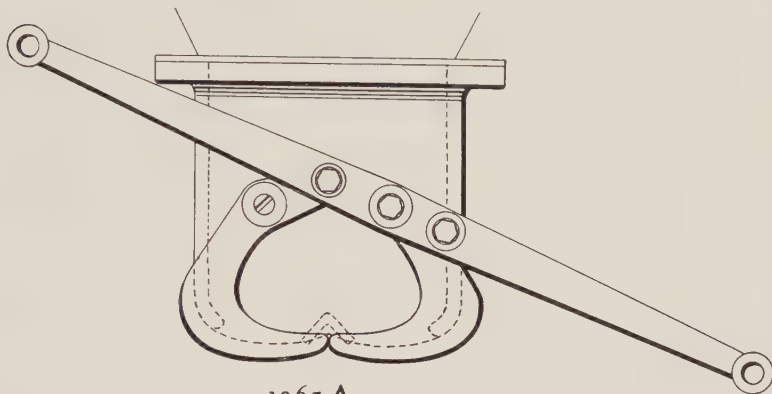
This chute is used in places where it is desired to measure the coal consumed and spread it upon the floor in front of the boiler.

The chute is hung from above on a ball-bearing track, and pivoted below. The upper gate is so connected with the lower gate, by a lock-rod, that it is impossible to open the upper gate until the lower one is fully closed. The rod is connected to a counter so that each charge fed into the chute is registered. The weight is so nicely balanced on the ball bearings that the entire chute and load can be swung around by the pressure of one finger.

Double Door Hopper Gate

Patented

This is a simple and effective form of quick-acting discharge gate. It is operated by rods or chains secured to the ends of cross lever. A downward pull on the left-hand end of the lever opens the gate; a downward pull on the right-hand end closes it. The gate gives a central discharge and can be operated at any height above the floor-line.

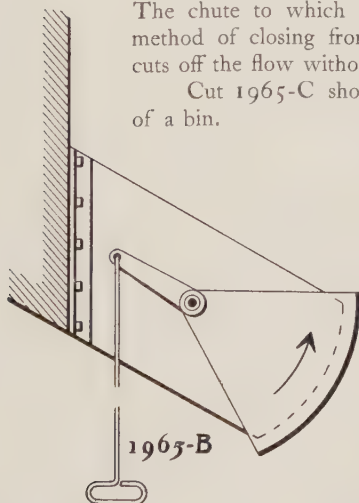


1965-A

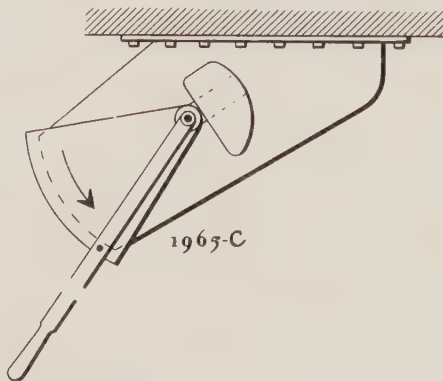
Link-Belt Undercut Gates

Cut 1965-B shows the undercut gate applied to a chute secured to the front of a hopper. The position shown in the cut is the closed position. To open the gate, the lever is thrown upward, dropping the gate down under the bottom of the chute; to close it, the lever is pulled downward, moving the gate upward through the material into the position shown. The chute to which the gate is attached is open on top, and the method of closing from the bottom upward through the material cuts off the flow without breakage or jamming.

Cut 1965-C shows the undercut gate applied to the bottom of a bin.



1965-B



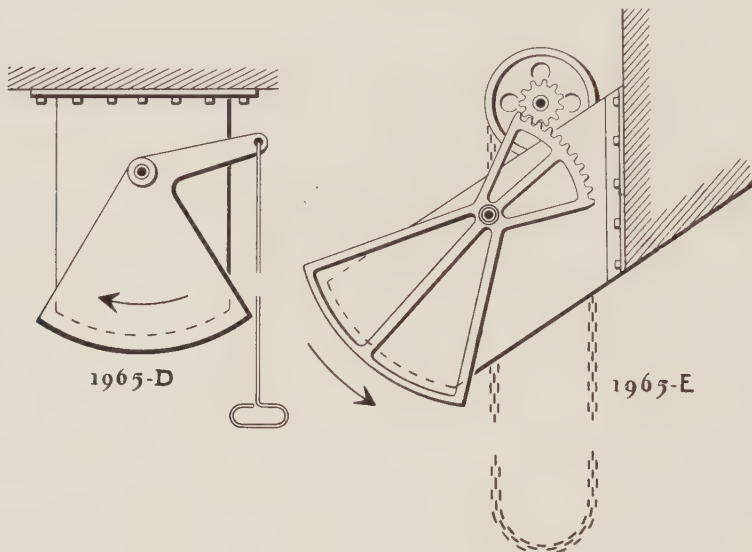
1965-C

(Continued on page 170)

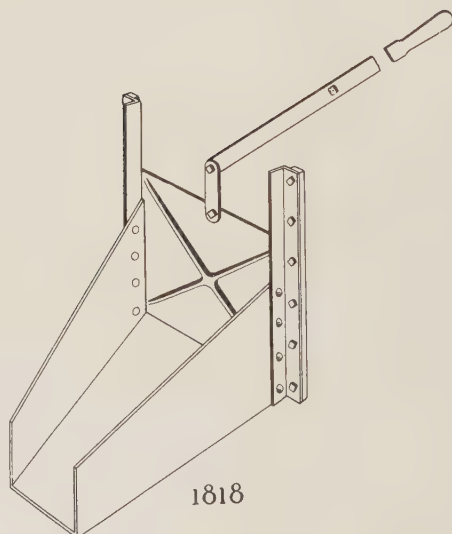
Undercut Gates—*Continued*

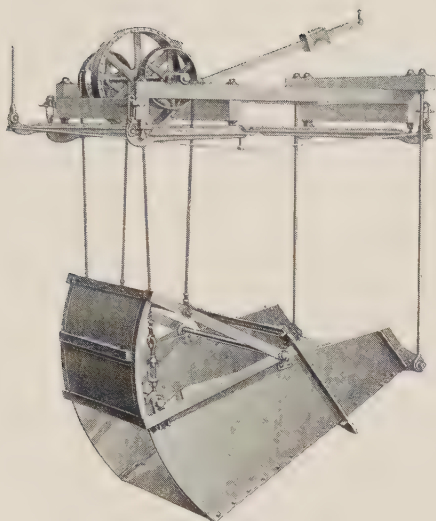
Cut 1965-D shows the undercut gate applied to a vertical chute.

Cut 1965-E shows the same class of gate operated by a rag wheel with crane chain actuating a pinion and spur segment. This means of operating is employed for gates of large size.



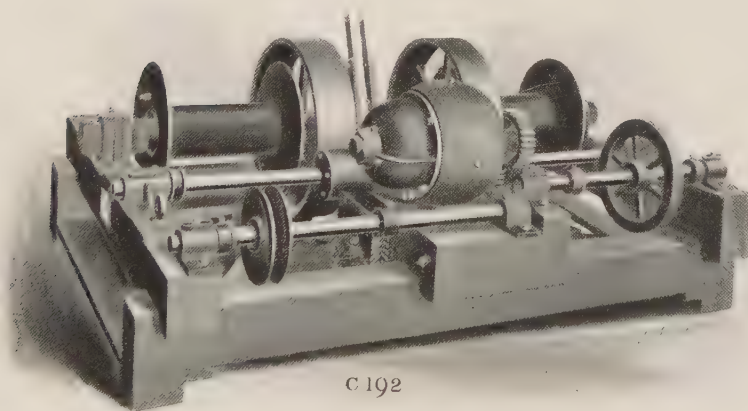
Cut 1818 shows our
Vertical Sliding Cast Iron
Cut-off Gate.





WEIGH BOX

Made of any size or capacity. Self discharging. Gates operated by hand or power. Are used in connection with locomotive coaling stations, bituminous coal tipples and anthracite breakers.

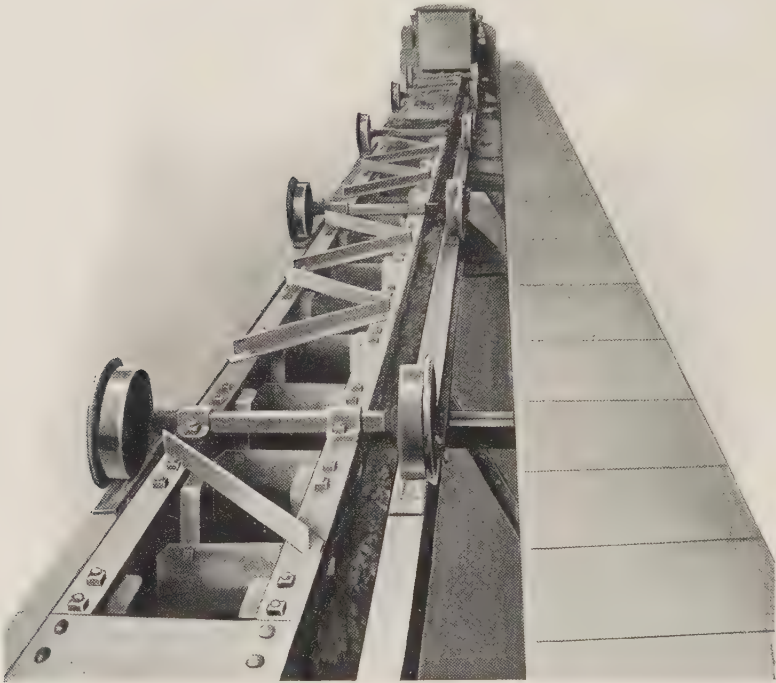


C 192

PORTABLE ELECTRIC POWER SCRAPER

For use on steamships for scraping coal to the hatchway, and in coal yards.

Reciprocating Conveyors



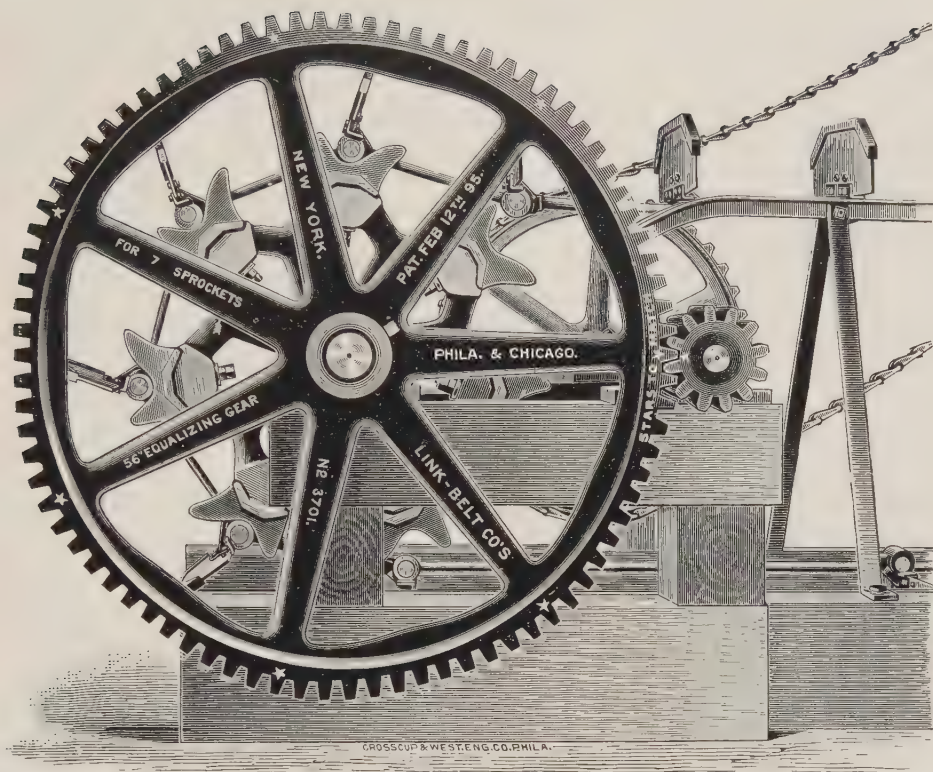
These conveyors, as we usually construct them, consist of a series of flights hinged at regular intervals to a steel frame.

The conveyor is given a reciprocating motion by a crank mechanism, which can be placed at any convenient point.

The flights are so hinged that in their forward motion they bear against stops and push the material along, while in their backward motion they return to the starting point by dragging back over the top of the material.

While reciprocating conveyors are not economical of power, owing to the frequency with which motion is reversed, they possess the advantage of having all the wearing parts outside of the material, greatly reducing cost of maintenance when gritty material is handled.

These machines are not applicable to conveying materials containing lumps.



The Link-Belt Equalizing Gears

Patented

Designed to give uniform speed to conveyor and elevator chains. They counteract the pulsating motion imparted by driving wheels revolving at uniform speed to chains of long pitch. This jerky motion is inherent in all chain and wheel mechanisms. Unfortunately it cannot be readily counteracted when chains of six inches or less pitch are employed, though equally destructive, if less noticeable, than in case of longer links.

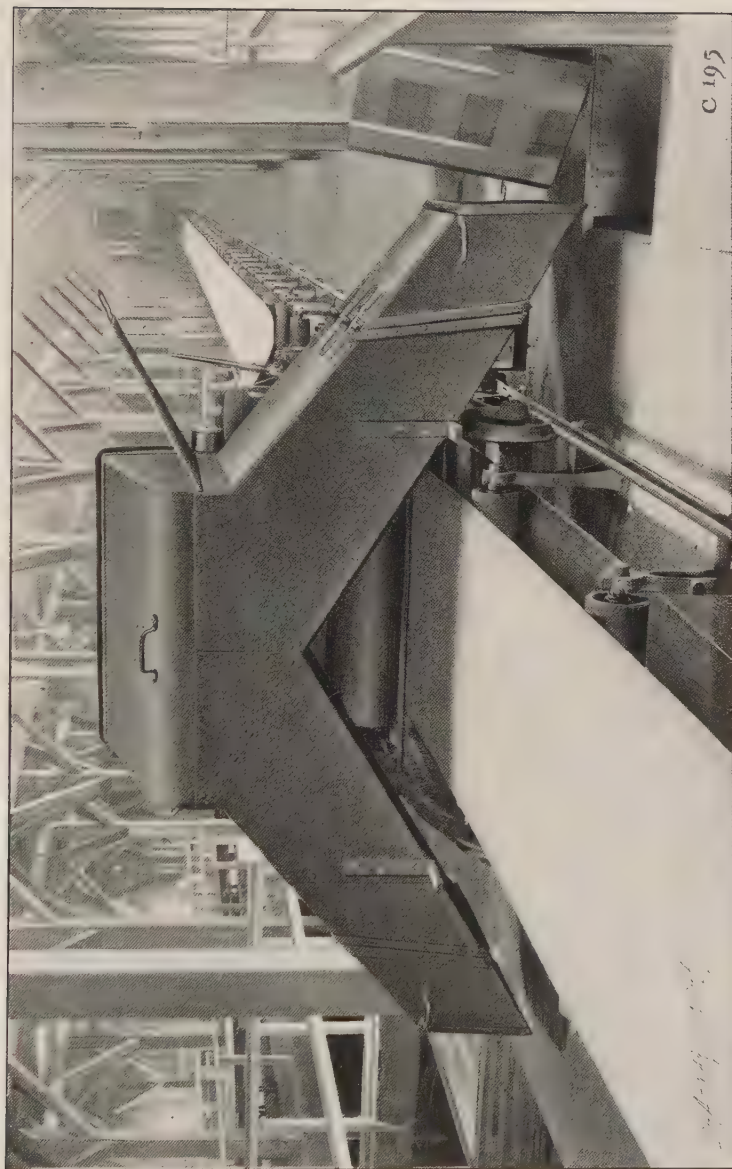
In the illustration a seven-tooth sprocket wheel is shown driving a chain of 18-inch links. As each link engages with the driving sprocket it is controlled by a radius $20\frac{3}{4}$ inches long, measured from the center of the sprocket wheel to the center of the hinge joint of the chain. When the wheel has made one-fourteenth of a revolution (or one-half the movement necessary to bring the next link of the chain into engagement with the sprocket) the controlling radius is reduced to $18\frac{3}{4}$ inches (measured from center of wheel to middle of chain link). This action is like that of a connecting rod, the horizontal movement varying in speed though the wheel to which it is attached revolves uniformly. If the sprocket wheel makes ten revolutions per minute, these alternations of chain speed occur 140 times per minute and are necessarily fatiguing and destructive to the chain, producing a violent increase of the normal strain at frequent intervals without any useful result.

The Equalizing Gears are designed to impart pulsating motion to the driving sprocket wheel exactly counteracting the variations of chain speeds above explained, and this is accomplished by making the pitch diameter of the spur wheel conform to a wave line, the number of elevations and depressions in this line corresponding with the number of sprockets of the chain wheel, and driving the spur wheel with an eccentric pinion as shown in the cut, the sprocket wheel and spur wheel being keyed on the head shaft in proper relative positions.

A series of exhaustive tests has developed the facts stated and proved the value of this gearing. By its use less power is required, and the destructive strains due to driving with circular gears are eliminated, thus permitting installations of greater length or the use of lighter chains. For price lists see page 278.

Belt Conveyors

CONVEYORS employing cotton or rubber belts of uniform ply, running over pulleys placed at intervals, have been used by this Company for the past twenty years in the handling of material to which they were adapted, but *as no form of conveyor as yet devised is of universal application*, we offer our customers a great variety of conveyors and elevators for the solution of their problems. Our experience justifies us in presenting the Belt Conveyors herein described, as typical of successful installation.



AN EXCELLENT TYPE OF FLAT BELT CONVEYOR

General view of conveyor floor of Minnesota Elevator (Armour & Co.), Chicago, showing one of three 40-inch belt conveyors, and self-propelling tripper. The steel rolls which support the belt are carried on combination high and low stands, with chairs for the rails on which the tripper travels.

Flat belts prove exceedingly durable, and form, under certain conditions, a conveying medium which, for capacity and low power consumption, cannot be excelled. The material is fed in a thin and narrow stream to the center of the belt and the latter is made very wide, relatively, to prevent the spilling of the material sideways. This extra width, while *costly*, insures *durability*.

Objections to Deep Troughing

To increase the carrying capacity of the belt per inch of width and reduce first cost, various methods of deep troughing have been resorted to; but as belts of uniform ply resist this excessive distortion, special flexible belts have been devised. All of these belts depend for their *cross-wise flexibility* upon the *omission* of some of the layers of cotton duck that *constitute the very back-bone* of the belt.

The belt is *made flexible* at the *expense* of *strength and life*. While its flexibility permits deep troughing and a materially greater carrying capacity, it results in the anomalous condition that by *making the belt weak* it is *made to carry more material*. The result is a very rapid destruction of the belt whenever it is called upon to do eight or ten hours' work every day of the year.

It can be laid down as an axiom that the more nearly a belt conveyor approaches the old type of flat belt, the longer will it last.

Intensifying the carrying capacity has resulted in lowering the cost of installation, but in exorbitantly increasing the cost of maintenance.

In the development of our belt conveyor business we have adhered to the following *cardinal principles* :

1. *The belt must be of uniform strength throughout its width. There must be no weakening of the belt in the center, where the load is carried ; no variation of strength crosswise, that would result in unequal stretch with its tendency to tear the rubber covering off and to open up the plies.*

2. *The troughing of the belt must be so shallow that a belt of uniform thickness will assume it naturally and without strain.*

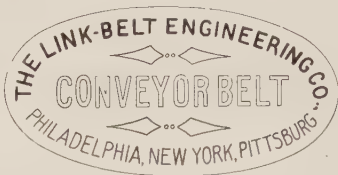
3. *The belt should be wide enough to permit the carrying of the load at moderate speeds.*

4. *The character of the belt, whether rubber, cotton layer, or solid woven cotton, should depend upon the material to be handled and the conditions under which the conveyor runs.*

5. *There is no such thing as a universal conveyor, and a belt should only be applied to uses for which it is specially adapted.*

Belting

Rubber belts are not always suitable. For some installations a cotton layer belt answers every requirement and is cheaper. For others the Solid Woven Cotton Belting will outlast two, and often three, of the best rubber belts. All rubber belts furnished by this Company are branded: They are made of any ply and with 1-16", 3-32", or 1/8" extra reinforcement of rubber on the carrying side when so required. The belts are made by reputable makers and the material and workmanship entering into them are of the best.

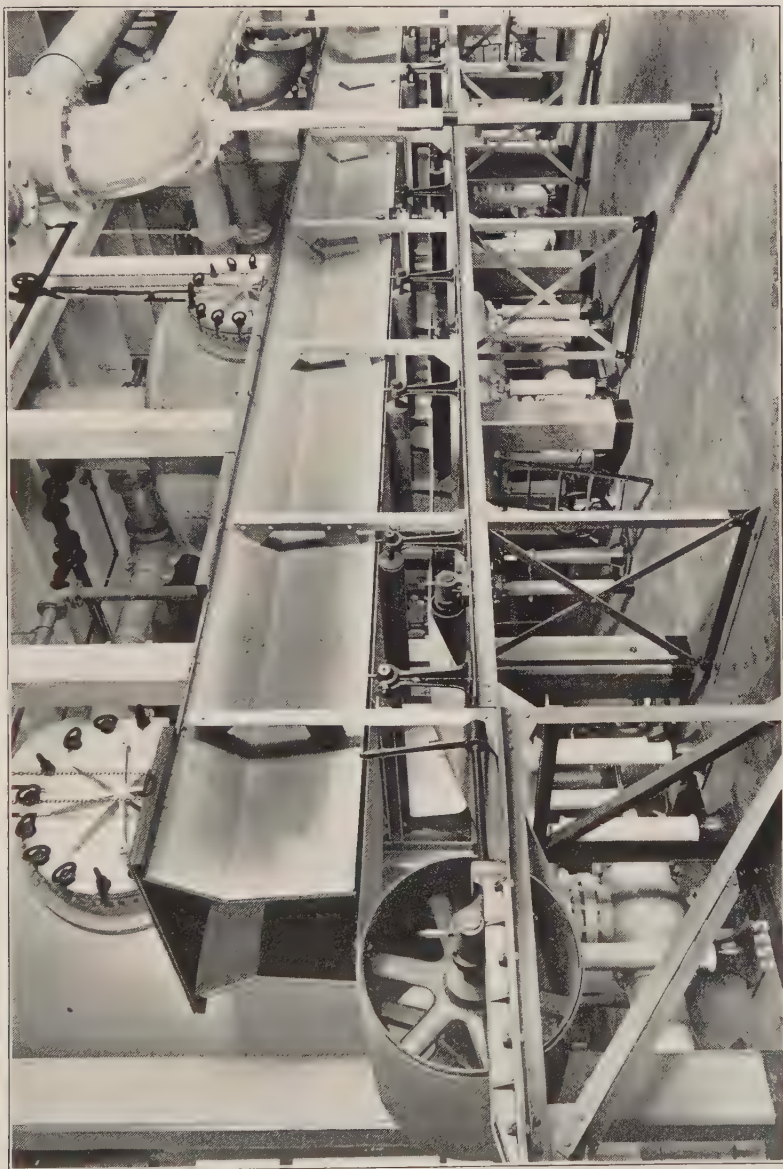


The Solid Woven Cotton Belt is proof against atmospheric changes and is surface hardened. It is an exceedingly strong and durable belt, made in four thicknesses up to 54" in width.

<i>Single.</i>	<i>Extra Stout.</i>	<i>Triple.</i>	<i>Heavy Triple.</i>
1/4" Thick.	3/8"—7/16"	1/2"—9/16"	5/8"—1 1/16"

We give herewith in pounds per inch of width the average breaking stress of each of the three stock thicknesses, which may be absolutely relied upon :

Single	Average Tensile Strength, 1,300 lbs. per inch of width.
	Average Weight per inch of width for 100', 10 lbs.
Extra Stout . .	Average Tensile Strength, 2,300 lbs. per inch of width.
	Average Weight per inch of width for 100', 15 lbs.
Triple	Average Tensile Strength, 3,000 lbs. per inch of width.
	Average Weight per inch of width for 100', 20 lbs.
Heavy Triple .	Made only to order.



FLAT COTTON BELT CONVEYOR USED FOR HANDLING WET WOOL FROM DIGESTERS

Arlington Mills, Lawrence, Mass.

Our belt is supported by truly-turned, well-balanced pulleys, lubricated by means of compression cups, delivering the grease at the center of the journals and forcing it outward. This insures that any dirt in the bearing is carried out with the grease, a film of the latter accumulating on the outside of the journal forming an effectual barrier against the entrance of foreign material.

The troughing idlers for narrow belts are made of the two-pulley type, with pulleys set at an angle of *only* 15° with the horizontal. This *results* in a *very shallow trough*. The belt assumes a *practically uniform curve crosswise* without strain or injury.

For belts 20 inches in width and over, the troughing idlers are of the three-pulley type, with each pulley in a separate cast iron bracket. This construction insures rigidity under heavy loads, and prevents the eccentric wear in the hub, so common to pulleys that are carried on overhanging studs. The pulleys are internally lubricated by means of compression grease cups.

The carrying rollers for return belts are set-screwed to the shafts, which run in swivel bearings lubricated internally by compression grease cups.

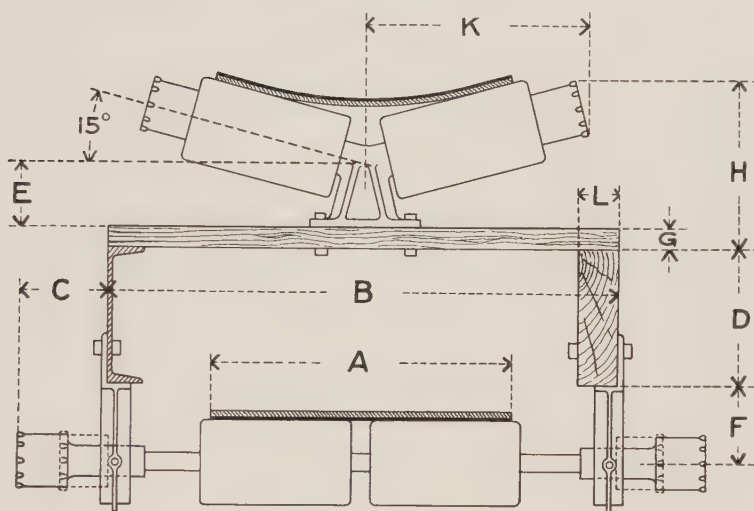
Side idlers of suitable construction are also furnished.

Unless otherwise directed, all troughing idlers will be shipped properly mounted on dressed yellow pine planks of standard lengths.

DIMENSIONS OF

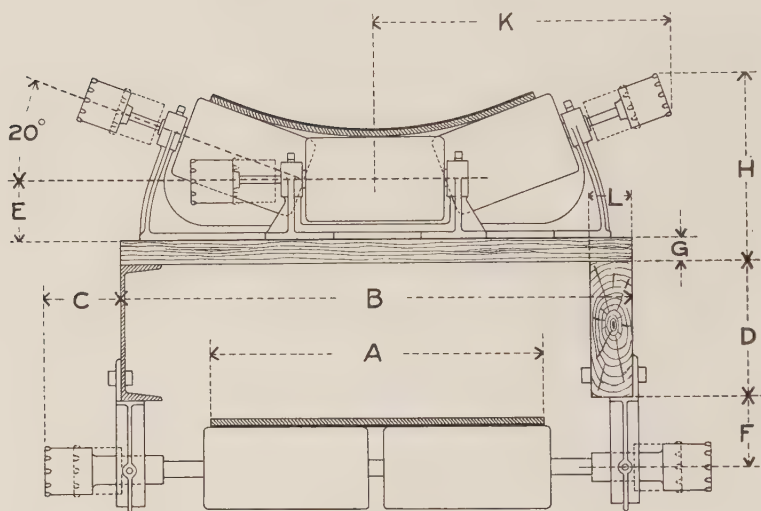
Troughing and Return Idlers

(Two-Pulley Type)



A	B	C	D		E	F	G	H	K	L
			Chan- nel	Wood Beam						
Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
12	24	5 3/8	7	7	3 3/4	4 1/2	1 1/4	8	12	2 1/2
14	26	5 3/8	7	7	3 3/4	4 1/2	1 1/4	8	12	2 1/2
16	28	5 3/8	8	8	3 3/4	4 1/2	1 1/4	9	13	2 1/2
18	30	5 3/8	8	8	3 3/4	4 1/2	1 1/4	9	13	2 1/2

DIMENSIONS OF
Troughing and Return Idlers
(Three-Pulley Type)



A	B	C	D		E	F	G	H	K	L
			Chan- nel	Wood Beam						
Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
20	32	5⅝	8	8	4	4½	1¼	11	19	3
24	37	5⅝	10	10	4¼	5	1¾	12	22	3
30	43	5⅝	10	10	4¼	5	1¾	13	25	3
36	48½	5⅝	10	10	4¼	5	1¾	14	27	3

Trippers

When Belt Conveyors are employed for discharging material at a number of points, an automatic tripper is used.



Plate 2327 shows a rear view of Automatic Self-Propelling Tripper in use at the plant of the Maryland Steel Co., Sparrow's Point, Maryland, shown in Plate 2314, page 186.

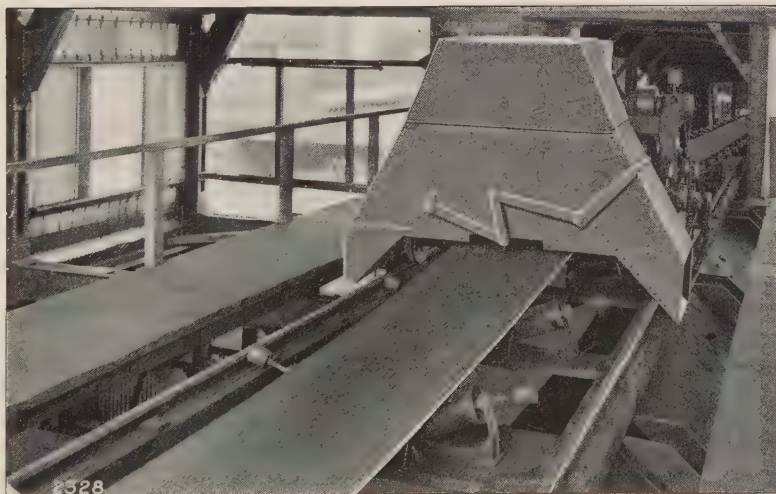
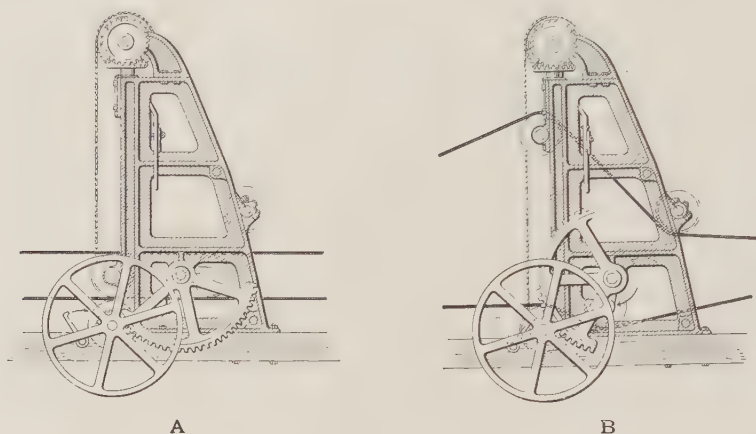


Plate 2328 shows front view of Automatic Self-Propelling Tripper at the plant of the Maryland Steel Co., Sparrow's Point, Maryland. Discharge chute is so arranged that coal can be discharged on either side of belt, or back to belt for delivery over head pulley.

The Link-Belt Stationary Tripper



One of these trippers is placed at each discharge point ; the tripping pulley is instantly raised into discharging position B, or lowered to position A, by power taken from belt. Saves time of shifting movable tripper, and by suitable arrangement of chutes enables load carried by belt to be discharged simultaneously at two or more points.

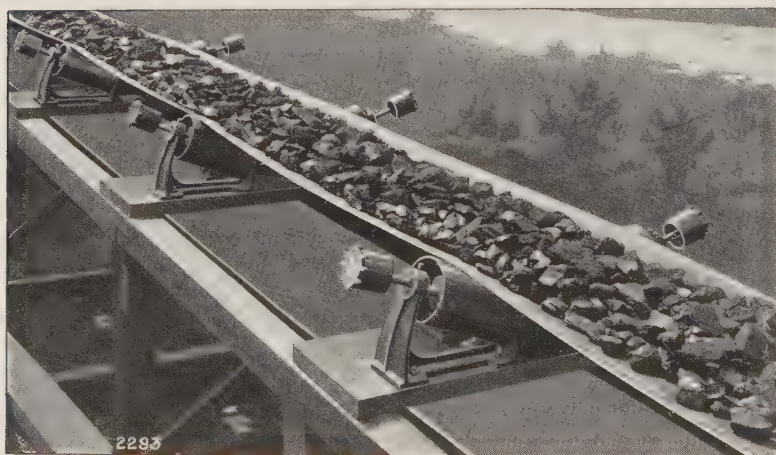
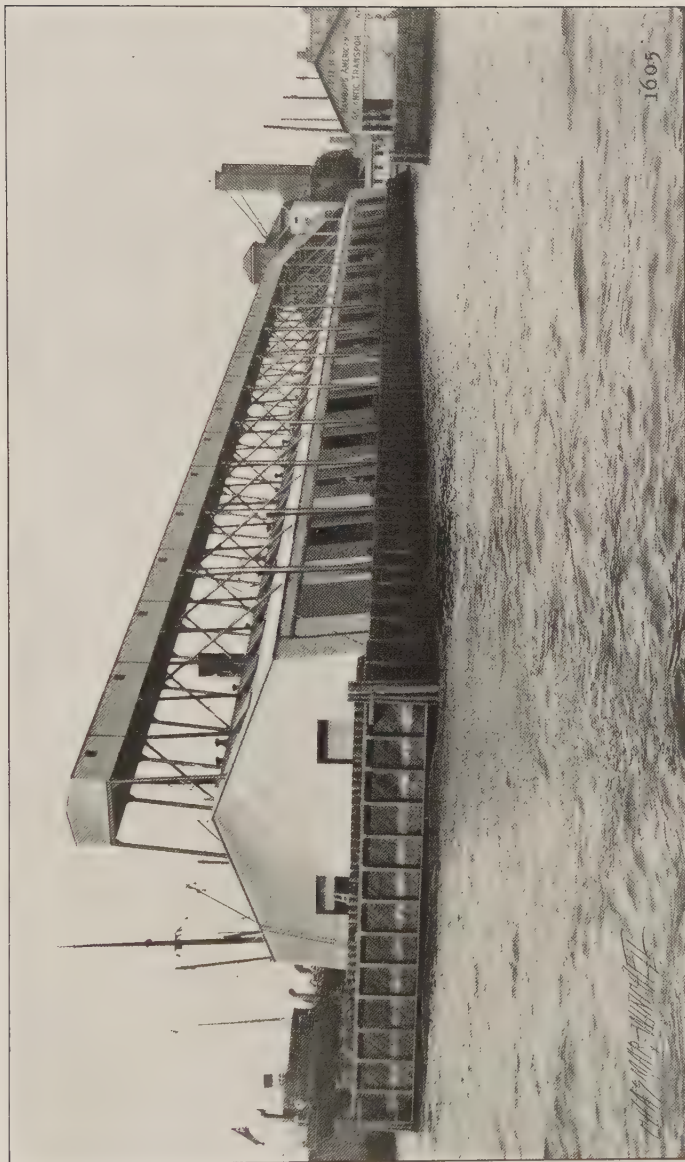


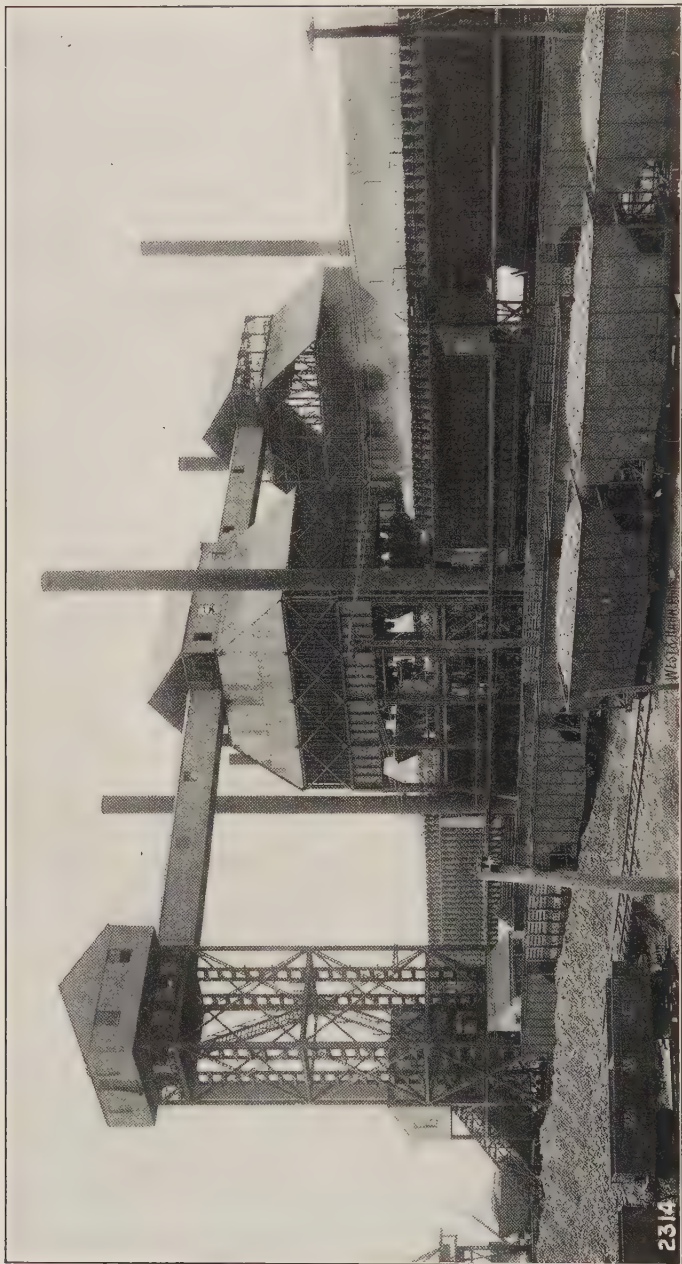
PLATE 2293 SHOWS SHALLOW TROUGH BELT, CARRYING BROKEN ANTHRACITE COAL



PENNSYLVANIA RAILROAD GRAIN ELEVATOR

Washington Avenue Wharf, Philadelphia, Pa.

The gallery over pier is equipped with two 36-inch rubber belt conveyors, 800 feet centers, driven from the land end. Each belt has a capacity of 14,000 bushels per hour. Discharge is effected through Link-Belt Stationary Trippers.



MARYLAND STEEL CO., COAL HANDLING SYSTEM

Sparrow's Point, Md.

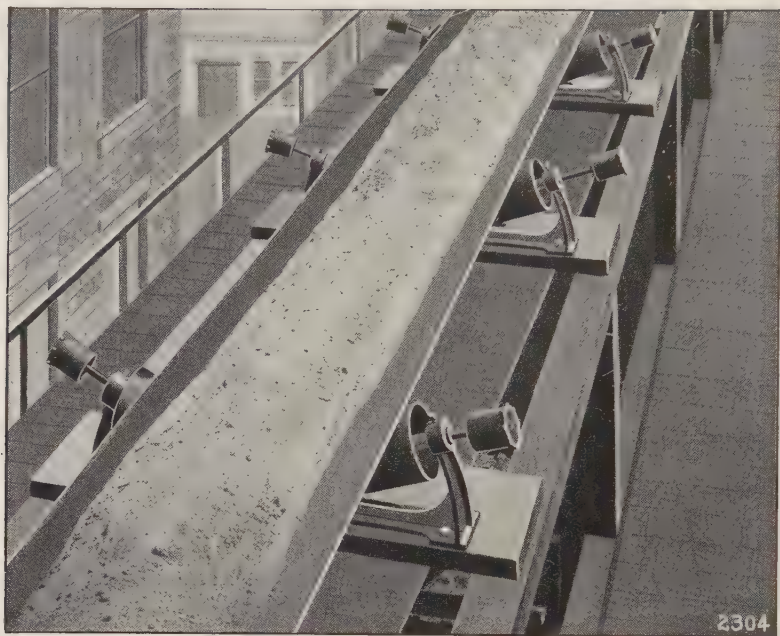
This system supplies 1,600 tons of coal each day to the two overhead bins for delivery to the coke ovens. A 30" Solid Woven Cotton Belt Conveyor receives coal from the two vertical elevators and carries it across the overhead bridges into the two bins at the rate of 250 tons per hour.

Plates 2301, 2304 and 2303 show the Shallow Trough Belt handling Foundry Coke, Dry Sand and Ashes, respectively. It will be noticed that the belts are carrying a full load in each case and that the troughing is sufficient to concentrate the material well in the center of the belt. There is not the slightest tendency for the material to approach the outside edges and there is absolutely no spilling.

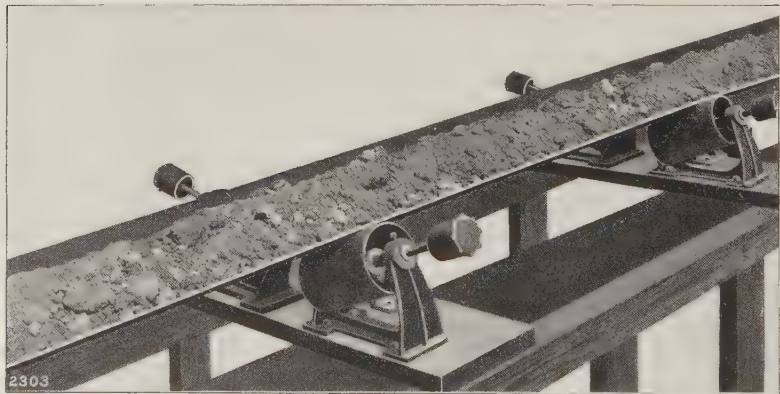
The Shallow Trough is in every case sufficient to retain the material, and it does this without strain to the belt.



SHALLOW TROUGH BELT, CONVEYING FOUNDRY COKE.



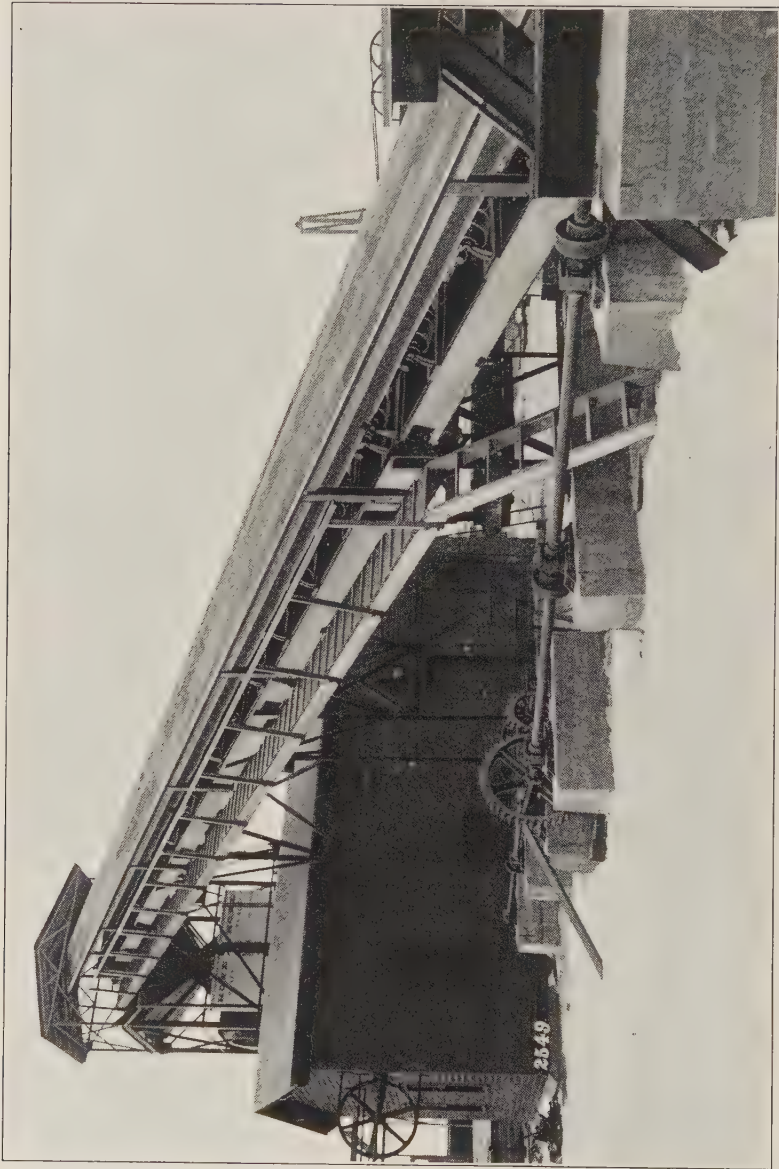
DRY SAND AS IT LOOKS ON A SHALLOW TROUGH BELT CONVEYOR
RUNNING AT 400 FEET PER MINUTE



SHALLOW TROUGH BELT CONVEYOR CARRYING ASHES



BY-PRODUCT COKE PLANT
Public Service Corporation, Camden, N. J.
Rubber Belt Conveyor System for Handling Coke



30-INCH INCLINED SHALLOW TROUGH BELT CONVEYOR
New York Edison Company's Plant, Shady Side, N. J.



24-INCH SHALLOW TROUGH BELT CONVEYOR CARRYING BUCKWHEAT COAL

New York Edison Company's Plant, Shady Side, N. J.

Chains

The recognized advantages of chain driving for power transmission are the following :

A POSITIVE SPEED RATIO.

A MINIMUM OF JOURNAL FRICTION, because the chain is run slack.

ADAPTABILITY TO HOT OR DAMP SITUATIONS.

ADAPTABILITY TO SHORT CENTERS.

While these advantages were recognized in a general way, it was not until the invention of the Ewart Detachable Link-Belt, in the early seventies, that chain driving grew to occupy any very large place in the realm of power transmission.

From its original application to harvesting machinery the use of this chain rapidly spread to other forms of power transmission, and then, by the invention of the various attachment links, to elevating and conveying machinery.

The subsequent development has taken two general directions :

First—In the line of driving chains, culminating in the Renold Silent Chain.

Second—In the line of elevating and conveying chains, embracing the Dodge, Howe Bull, Giant, Monobar, Closed-Joint and Ley types.

A chain gear consists essentially of a chain running over two sprocket wheels, engaging with the sprocket teeth thereon and transmitting power from one wheel, known as the DriveR, to another known as the DriveN.

In designing a chain for a given service, the first point to be considered is the working load.

Sufficient bearing surface in the joint of the chain must be provided so that the load per unit of bearing area shall not exceed the figure determined by experience as the proper one. This bearing load will vary with the material of which the chain is made.

Having determined on the bearing surface, tensile strength is next to be considered, but it will usually be found that when sufficient bearing surface is provided, the required tensile strength is also present.

It is next necessary to decide on the pitch. This depends upon the minimum and maximum diameters of sprocket wheels to be used. Depending upon the speed, the minimum number of teeth should be from seven to ten. If a small diameter is essential, then the pitch must also be small. Similarly, if a large wheel is used the pitch must be made long to avoid an excessive number of teeth.

In any event, the tooth-space in the link must be sufficient not only to accommodate the tooth, which should have both strength and metal for wear, but also to provide the necessary clearance between the link and the tooth. This clearance is necessary that the chain may wear and lengthen a certain amount without "climbing the sprockets."

For a given service a chain must have sufficient bearing surface as well as strength.

The working loads recommended elsewhere are based on the above considerations and will be found safe under ordinary conditions. It will be noted that the factor of safety increases with the speed. This is right because the friction losses and the loss from imperfect fit increase with the speed, diminishing the useful working load. This applies to all types except the Renold Silent Chain.

Other considerations of equal importance are quality of metal and accuracy of workmanship. The pitch must be uniform, the joints must articulate freely without excessive play, and bearings must be smooth. Careful and systematic inspection and tests are essential to secure these results.

EWART DETACHABLE LINK-BELT should be run—

Hook end first on drives.

Bar end first on elevators and conveyors.

CLOSED-JOINT CHAINS, like the 700 series and Ley chains, should be run—

Barrel end first on drives.

Pin end first on elevators and conveyors.

Both the joints of the chain and the faces of the sprockets should be thoroughly and frequently lubricated. A grease answers best for the sprockets, and a heavy oil for the chain joints.

Avoid very short centers.

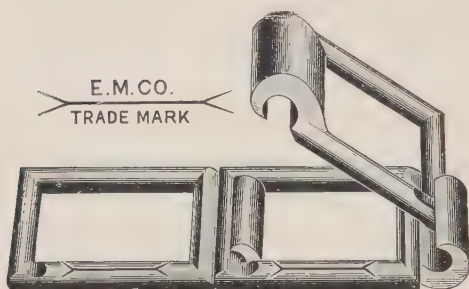
Avoid drives that are vertical or nearly so.

By running the chain as directed, a maximum life for both chain and wheels is obtained.

Ewart Detachable Link-Belting

The original Ewart Detachable Link-Belting is made of refined malleable iron, is accurately pitched, and subjected to static and running tests before leaving the factory.

It is, as heretofore, manufactured by the Ewart Manufacturing Co., the



original designers and manufacturers of Detachable Drive Chains, or Link-Belting. All the forms of plain and attachment links were first produced by them. They possess all the master patterns and gauges. Their

chains are always reliable. **They are the Standard.**

Ceaseless vigilance, the best materials, improved machinery and constant tests are necessary for the production of a high-grade chain such as the Ewart Link-Belt is to-day.

The patterns must be accurate and must be maintained so. The moulding must be carefully done. The composition of the iron must be watched and kept unvarying.

After the link comes from the annealing pot it goes through sixteen different processes before it is finally delivered to the shipping room as a tested and guaranteed product.

EWART LINK-BELT is made in a number of types suitable for different uses.

Some chains are good elevator chains that are unsuitable for driving (power transmission) and *vice versa*.

Typical power chains are Nos. 35, 45, 67, 75, 77, 78, 88, 103, 114 and 124.

Typical elevator chains are Nos. 85, 95, 108, 110 and 122.

Chains such as 51, 52 and 62, with small tooth space, are used for driving where back-lash or lost motion is objectionable. Sprocket wheels with large number of teeth will not work well with these chains for any length of time. This is because the scant clearance between the tooth and the chain link allows only a small amount of stretch before the chain rides on top of the sprocket teeth.

Original Ewart Detachable Link-Belting

No. 25. Full size; breaking strain, 680 lbs.



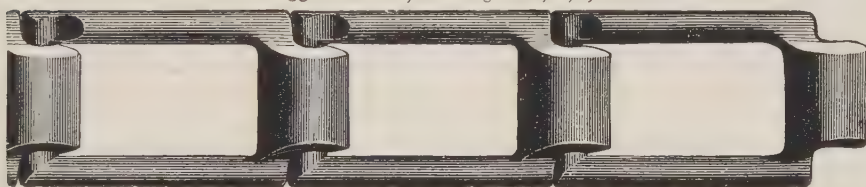
Attachments: A³, C¹, C⁵, D³, E¹, G¹, H², K¹, K⁵, K⁶, M¹, S¹. Coupling Links.

No. 32. Full size; breaking strain, 1,100 lbs.



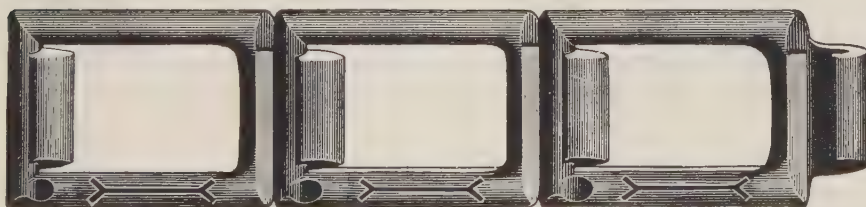
Attachments: A¹, A³, C¹, E¹, K¹, K³, K⁵, K⁶. Coupling Links.

No. 33. Full size; breaking strain, 1,190 lbs.



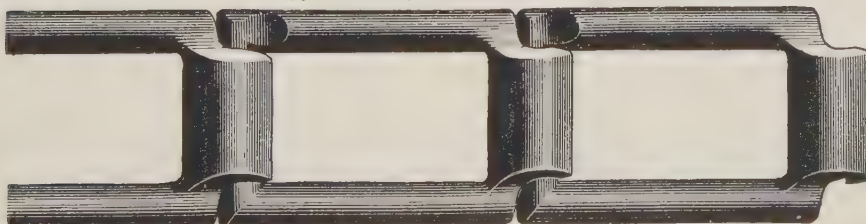
Attachments: A¹, E¹, K¹, K³, K⁵, K⁶, M¹, S¹. Coupling Links.

No. 34. Full size; breaking strain, 1,260 lbs.



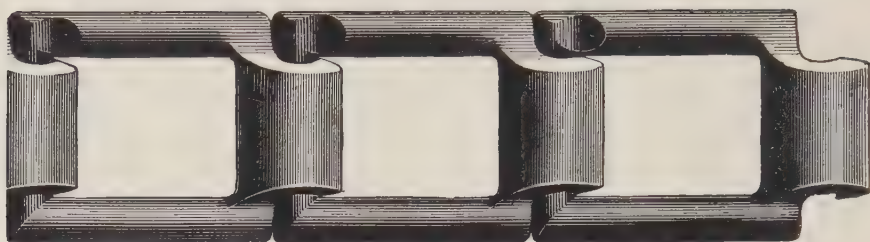
Attachments: A¹, E¹, K¹. Coupling Links.

No. 35. Full size; breaking strain, 1,190 lbs.



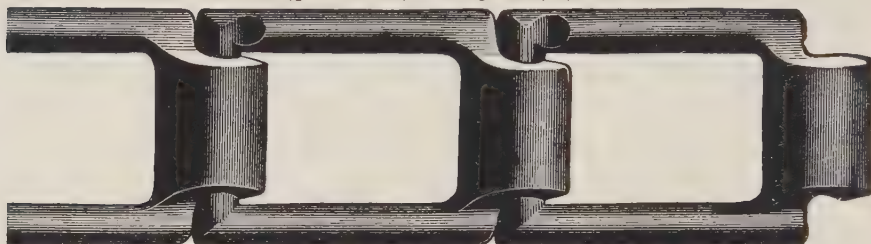
Attachments: A¹, A², C¹, K¹, S¹. Coupling Links.

No. 42. Full size; breaking strain, 1,520 lbs.



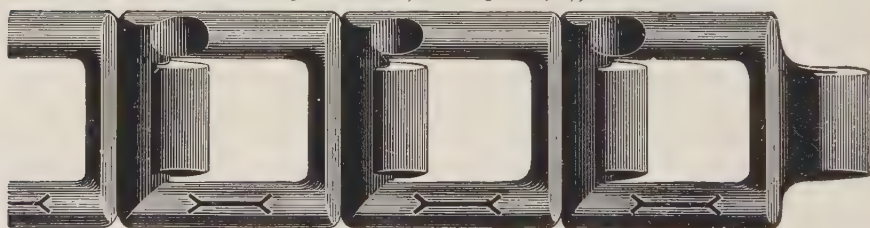
Attachments: A¹, C¹, K³, K⁵, K⁶, S¹.

No. 45. Full size; breaking strain, 1,610 lbs.



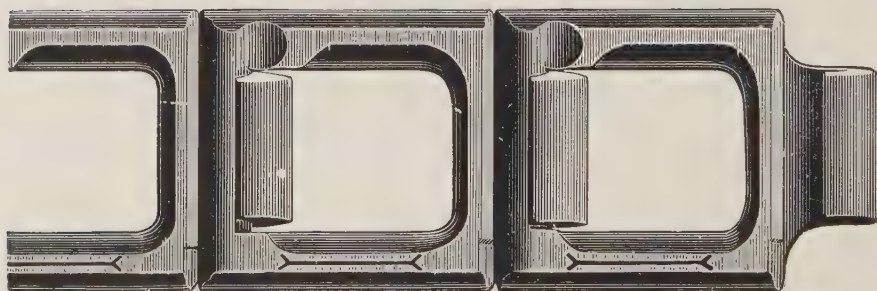
Attachments: A¹, A³, C¹, D¹, D³, D⁵, E¹, F², G¹, H¹, H², K¹, K³, K⁵, M¹, S¹.
Coupling Links.

No. 51. Full size; breaking strain, 1,900 lbs.



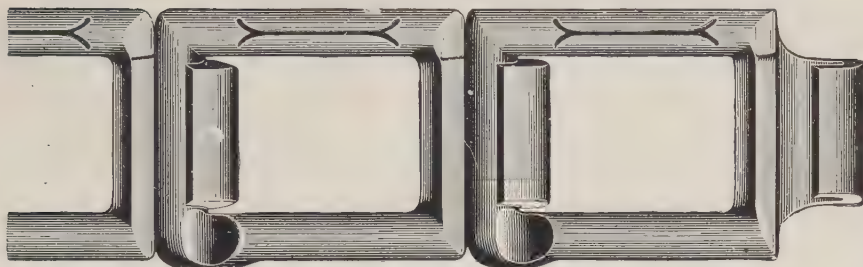
Attachments: A¹, D⁴, K⁵.

No. 52. Full size; breaking strain, 2,340 lbs.



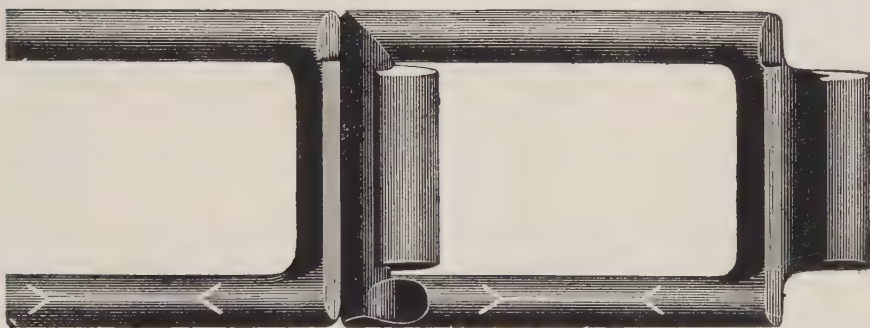
Attachments: A¹, D⁴, D¹³, G¹, K⁵.

No. 55. Full size ; breaking strain, 2,180 lbs.



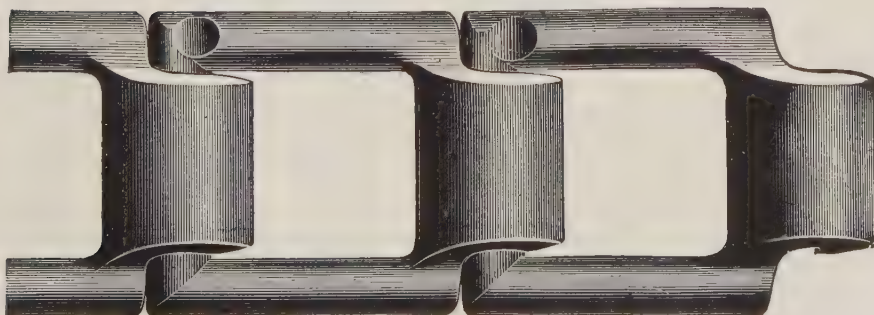
Attachments : A¹, A², C¹, E¹, F², K¹, K⁵, M¹, S¹. Coupling Links.

No. 57. Full size ; breaking strain, 2,770 lbs.

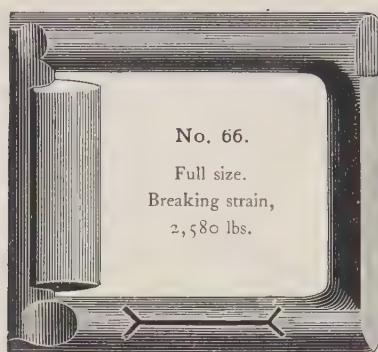


Attachments : A¹, D⁵, E¹, F², H², K¹, S². Coupling Links.

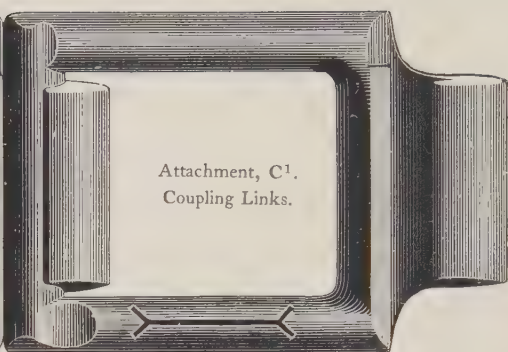
No. 62. Full size ; breaking strain, 3,120 lbs.



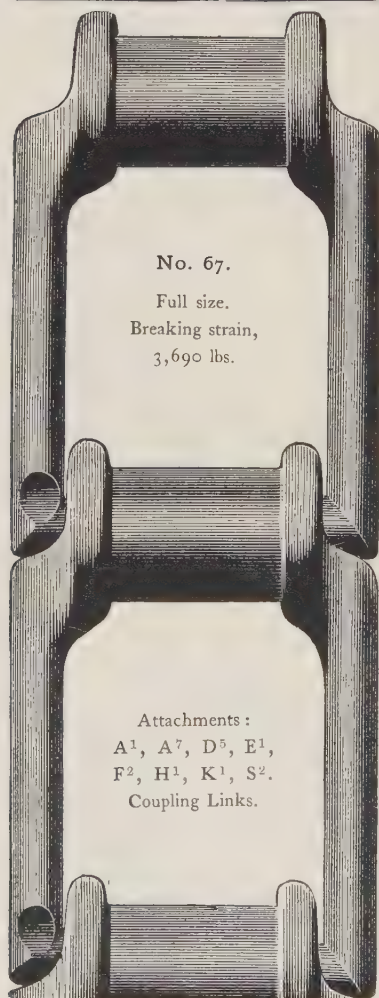
Attachments : A¹, A¹², C¹, D⁵, K¹, K⁵. Coupling Links.



No. 66.
Full size.
Breaking strain,
2,580 lbs.

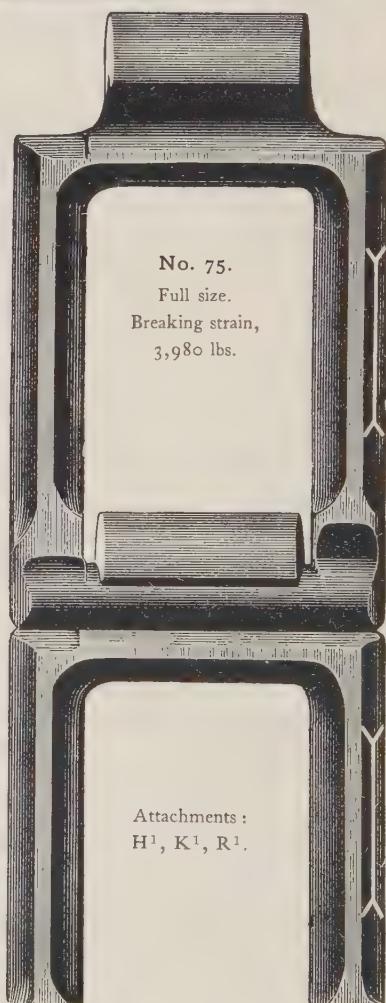


Attachment, C¹.
Coupling Links.



No. 67.
Full size.
Breaking strain,
3,690 lbs.

Attachments :
A¹, A⁷, D⁵, E¹,
F², H¹, K¹, S².
Coupling Links.

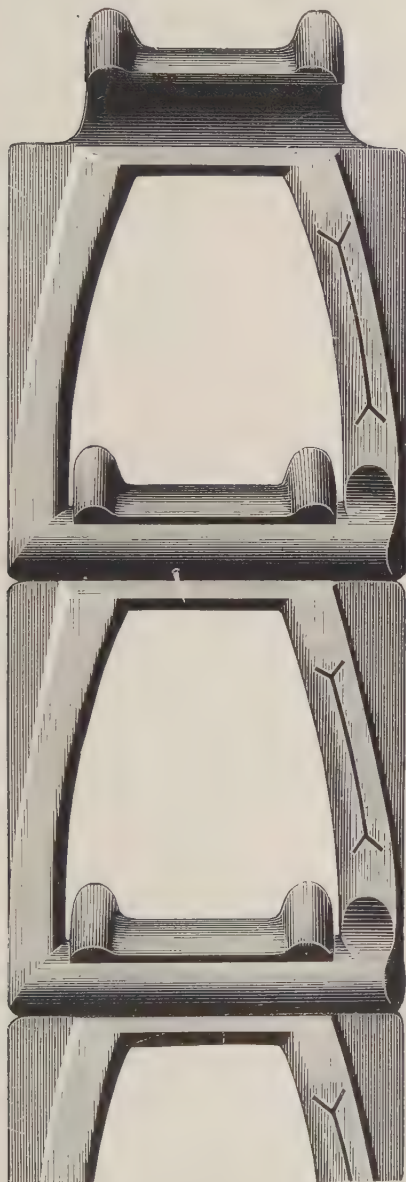


No. 75.
Full size.
Breaking strain,
3,980 lbs.

Attachments :
H¹, K¹, R¹.

No. 77

Full size; breaking strain, 3,640 lbs.

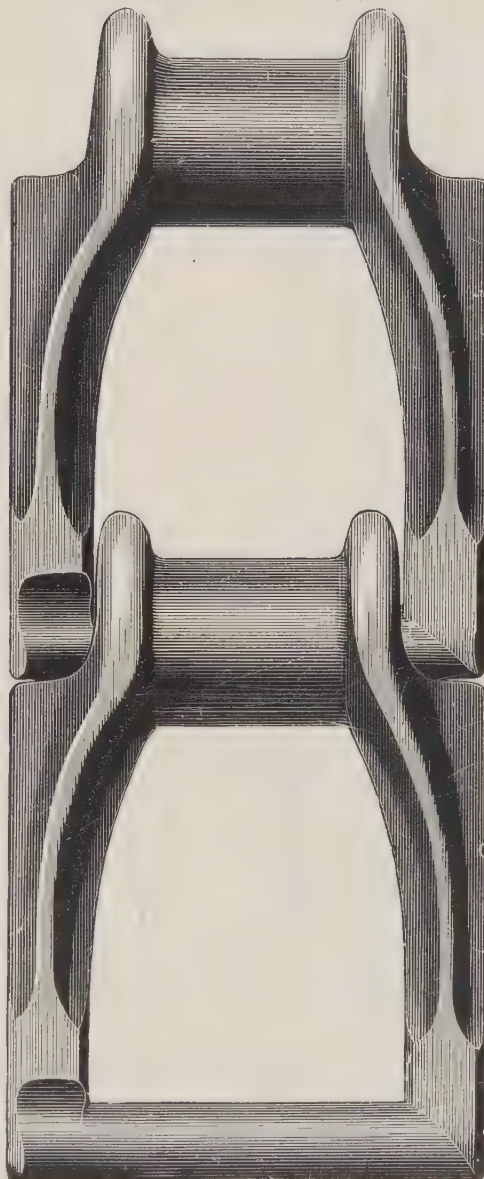


Attachments:

A¹, F², G¹, G⁶, H¹, K¹, R¹, S².
Coupling Links.

No. 78

Full size; breaking strain, 4,935 lbs.



Attachments :

A³, A⁷, A¹¹, D¹, E¹, F², F¹, G¹, G⁶, H²,
K¹, M², R¹, S². Coupling Links.



No. 85

Full size.

Breaking strain, 7,580 lbs.

Attachments: F², K².

Coupling Links.

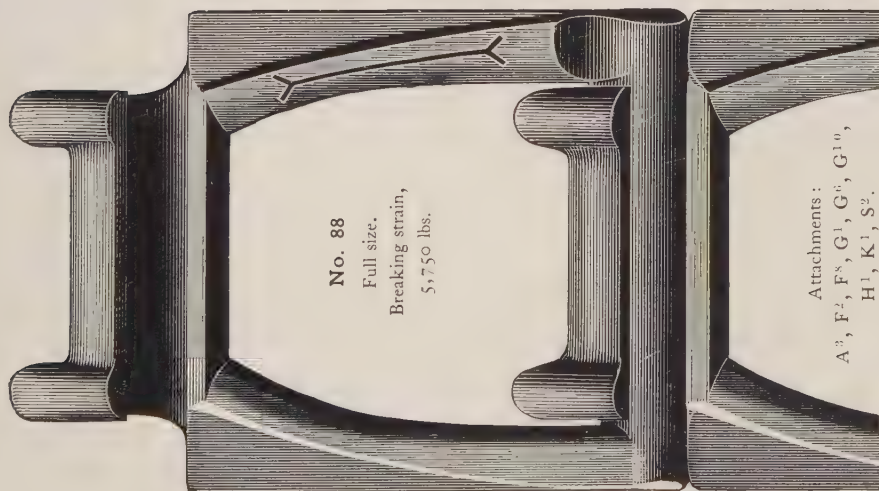


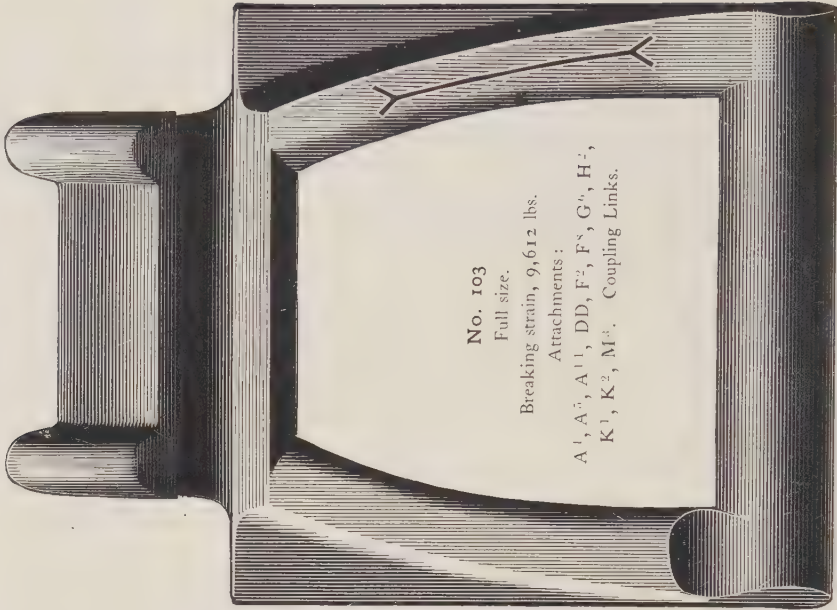
No. 83

Full size.

Breaking strain, 4,950 lbs.

Attachments: D¹, M³.





No. 103

Full size.

Breaking strain, 9,612 lbs.

Attachments :

A¹, A², A¹¹, DD, F², F³, G⁶, H²,
K¹, K², M³. Coupling Links.



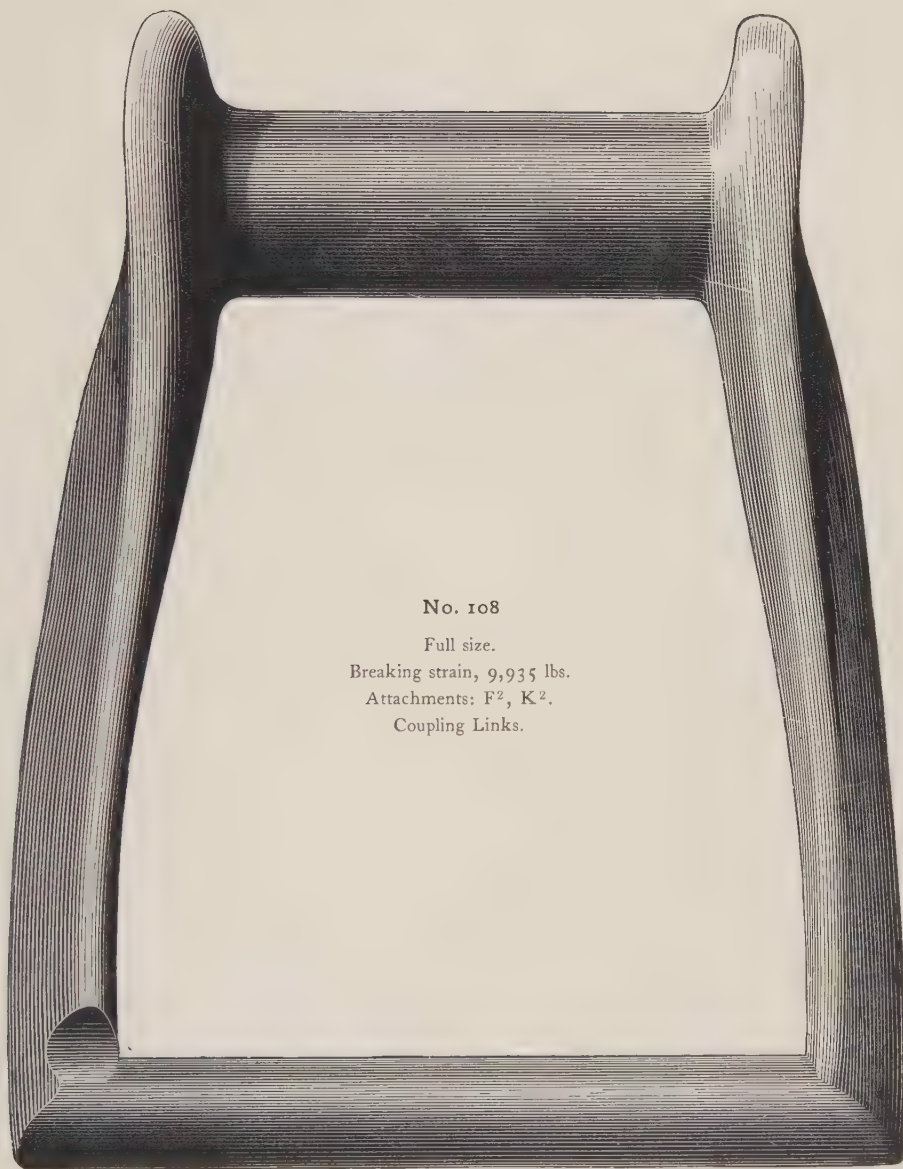
No. 95

Full size.

Breaking strain, 8,680 lbs.

Attachments: F², K².

Coupling Links.



No. 108

Full size.

Breaking strain, 9,935 lbs.

Attachments: F², K².

Coupling Links.



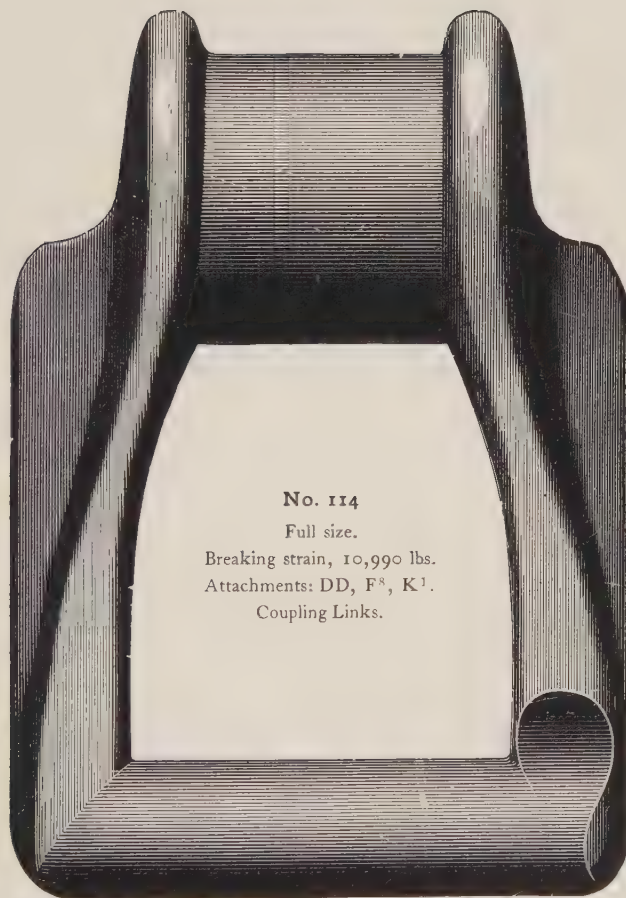
No. 110

Full size.

Breaking strain, 12,670 lbs.

Attachments: F², K².

Coupling Links.



No. 114

Full size.

Breaking strain, 10,990 lbs.

Attachments: DD, F⁸, K¹.

Coupling Links.



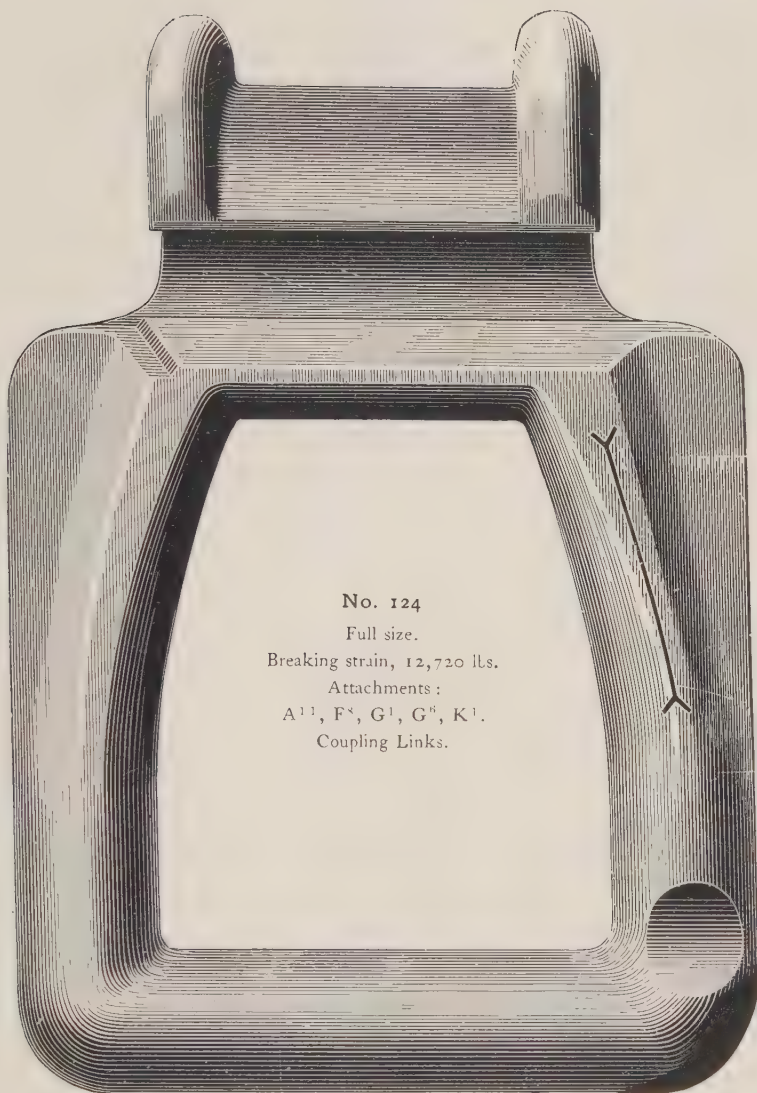
No. 122

Full size.

Breaking strain, 14,980 lbs.

Attachments: F², K².

Coupling Links.



No. 124

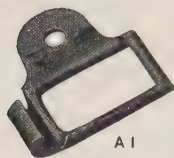
Full size.

Breaking strain, 12,720 lbs.

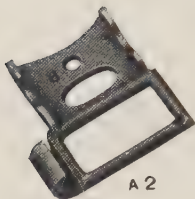
Attachments :

A¹¹, F^s, G¹, Gⁿ, K¹.

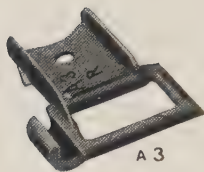
Coupling Links.



A 1



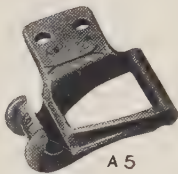
A 2



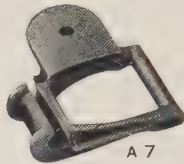
A 3



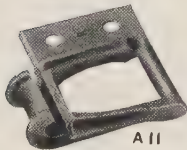
A 4



A 5



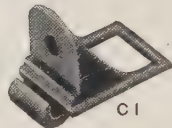
A 7



A 11



A 12



C 1



C 5



D 1



D 3



D 4



D 5



D 13



DD



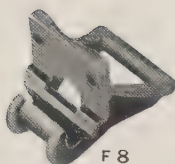
E 1



F 2



F 4



F 8



G 1



G 6



G 10



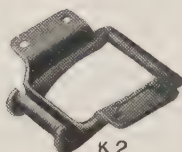
H 1



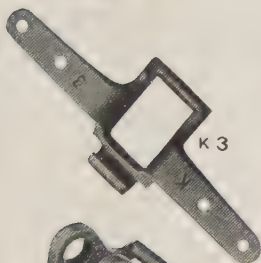
H 2



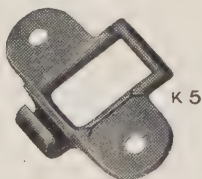
K 1



K 2



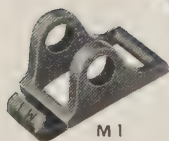
K 3



K 5



K 6



M 1



M 3



R 1



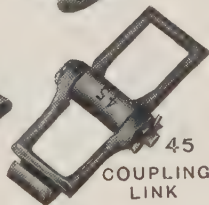
R 3



S 1



S 2



45
COUPLING
LINK

Method of Using Ewart Detach- able Link-Belt Attachments



A. ATTACHMENTS



F2. ATTACHMENT



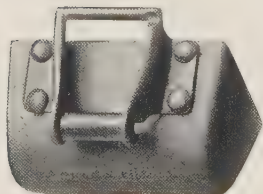
S2. ATTACHMENT



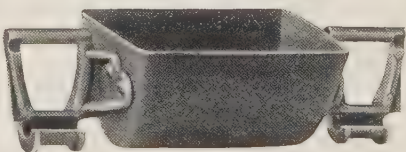
C1. ATTACHMENT



E. ATTACHMENTS



K. ATTACHMENTS



G. ATTACHMENTS

Price List of the Original Ewart Detachable Link-Belting

No.	PRICE PER FOOT			Coupling Links per pair	Links per foot	Breaking Strains
	All Plain Links	All Attach- ment Links	With Attach- ments at Intervals			
25	\$0.12	\$0.28	\$0.17	\$0.06	13.3	700
32	.12	.25	.17	.06	10.4	1,100
33	.12	.25	.17	.07	8.6	1,190
34	.12	.25	.17	.08	8.6	1,300
35	.12	.25	.17	.09	7.4	1,200
42	.13	.27	.18	.11	8.8	1,500
45	.13	.27	.18	.11	7.4	1,600
51	.17	.30	.22	.12	10.4	1,900
52	.18	.30	.22	.12	8	2,300
55	.18	.28	.21	.12	7.4	2,200
57	.18	.36	.24	.17	5.2	2,800
62	.24	.41	.30	.18	7.3	3,100
66	.24	.41	.30	.18	6	2,600
67	.24	.41	.30	.18	5.2	3,700
75	.28	.45	.34	.21	4.6	4,000
77	.28	.45	.34	.21	5.2	3,600
78	.32	.56	.40	.28	4.6	4,900
83	.36	.67	.53	.37	3	4,950
85	.40	.70	.54	.50	3	7,600
88	.38	.68	.53	.32	4.6	5,750
93	.45	.70	.56	.50	3	7,500
95	.48	.90	.68	.60	3	8,700
103	.60	.90	.75	.66	4	9,600
108	.60	1.00	.82	.90	2.55	9,900
110	.75	1.20	.90	1.05	2.55	12,700
114	.75	.96	.87	.96	3.7	11,000
122	.90	1.40	1.15	1.80	2	15,000
124	.90	1.50	1.20	1.35	3	12,700
146	.90	1.40	1.15	.	2	14,000

The above prices of attachments are for A¹, A², A³, C¹, E¹, F²; G¹; G⁶, H¹, H², K¹, K², M¹, M³, R¹, R³, S¹ and S², and as they are now made for the respective chains. Other attachments will be furnished at special prices.

For wheel lists see pages 261 to 269 inclusive.

How to Obtain the Working Strains for Ewart Chains

The working strains are obtained by dividing the breaking strains, given on the preceding page, by the following factors :

For a speed of	Divide by
200 feet per minute and under	6
300 feet per minute and under	8
400 feet per minute and under	10
500 feet per minute and under	12
600 feet per minute and under	16
700 feet per minute and under	20

As an example, take the case of No. 88, with a breaking strain of 5,750 lbs.

At 200 feet per minute the working strain will be	960
At 300 feet per minute the working strain will be	720
At 400 feet per minute the working strain will be	575
At 500 feet per minute the working strain will be	480
At 600 feet per minute the working strain will be	360
At 700 feet per minute the working strain will be	287

Attachments

As usually made for Ewart Detachable Link-Belting

CARRIED IN STOCK

No.	ATTACHMENT LIST	
25.	A ³ , C ¹ , C ⁵ , D ³ , E ¹ , G ¹ , H ² , K ¹ , K ⁵ , K ⁶ , M ¹ , S ¹	Coupler
32.	A ¹ , A ³ , C ¹ , E ¹ , K ¹ , K ³ , K ⁵ , K ⁶	Coupler
33.	A ¹ , E ¹ , K ¹ , K ³ , K ⁵ , K ⁶ , M ¹ , S ¹	Coupler
34.	A ¹ , E ¹ , K ¹	Coupler
35.	A ¹ , A ² , C ¹ , K ¹ , S ¹	Coupler
42.	A ¹ , C ¹ , K ³ , K ⁵ , K ⁶ , S ¹	Scrapers Couplers
45.	A ¹ , A ³ , C ¹ , D ¹ , D ³ , D ⁵ , E ¹ , F ² , G ¹ , H ² , K ¹ , K ³ , K ⁵ , M ¹ , S ¹	
51.	A ¹ , D ⁴ , K ⁵	Coupler
52.	A ¹ , D ⁴ , D ¹³ , G ¹ , K ⁵	Coupler
55.	A ¹ , A ² , C ¹ , E ¹ , F ² , K ¹ , K ⁵ , M ¹ , S ¹	Coupler
57.	A ¹ , D ⁵ , E ¹ , F ² , H ² , K ¹ , S ¹	Coupler
62.	A ¹ , A ¹² , C ¹ , D ⁵ , K ¹ , K ⁵	Coupler
66.	C ¹	Coupler
67.	A ¹ , A ⁷ , D ⁵ , E ¹ , F ² , H ¹ , K ¹ , S ²	Coupler
75.	H ¹ , K ¹ , R ¹	Coupler
77.	A ¹ , F ² , G ¹ , G ⁶ , H ¹ , K ¹ , R ³ , S ²	Coupler
78.	A ³ , A ⁷ , A ¹¹ , D ⁵ , E ¹ , F ² , F ⁴ , G ¹ , G ⁶ , H ² , K ¹ , M ³ , R ¹ , S ²	Coupler
83.	D ⁵ , M ³	Coupler
85.	F ² , K ²	Coupler
88.	A ¹ , F ² , F ⁴ , G ¹ , G ⁶ , G ¹⁰ , H ¹ , K ¹ , S ²	Coupler
93.	G ¹	
95.	F ² , K ²	Coupler
103.	A ⁴ , A ⁵ , A ¹¹ , DD, F ² , F ⁸ , G ⁶ , H ² , K ¹ , K ² , M ³	Coupler
108.	F ² , K ²	Coupler
110.	F ² , K ²	Coupler
114.	DD, F ⁸ , K ¹	Coupler
122.	F ² , K ²	Coupler
124.	A ¹¹ , F ⁸ , G ¹ , G ⁶ , K ¹	Coupler

In addition to the above, we have 500 patterns of special attachments. Many of these attachments are covered by United States letters patent.

Pin Chains, "700 Class"

See cuts on opposite page

These chains were designed to meet the demand for a closed-joint chain of greater strength than the Ewart chains, and yet not as expensive as the Ley bushed chains.

The proportions of the links are such as to avoid shrinkage strains and to provide ample bearing surface as well as strength.

The best refined malleable iron is used for the links and they are made absolutely square and true to pitch.

These chains are excellent for both elevator and conveyor service where little grit is encountered.

LIST OF PIN CHAINS

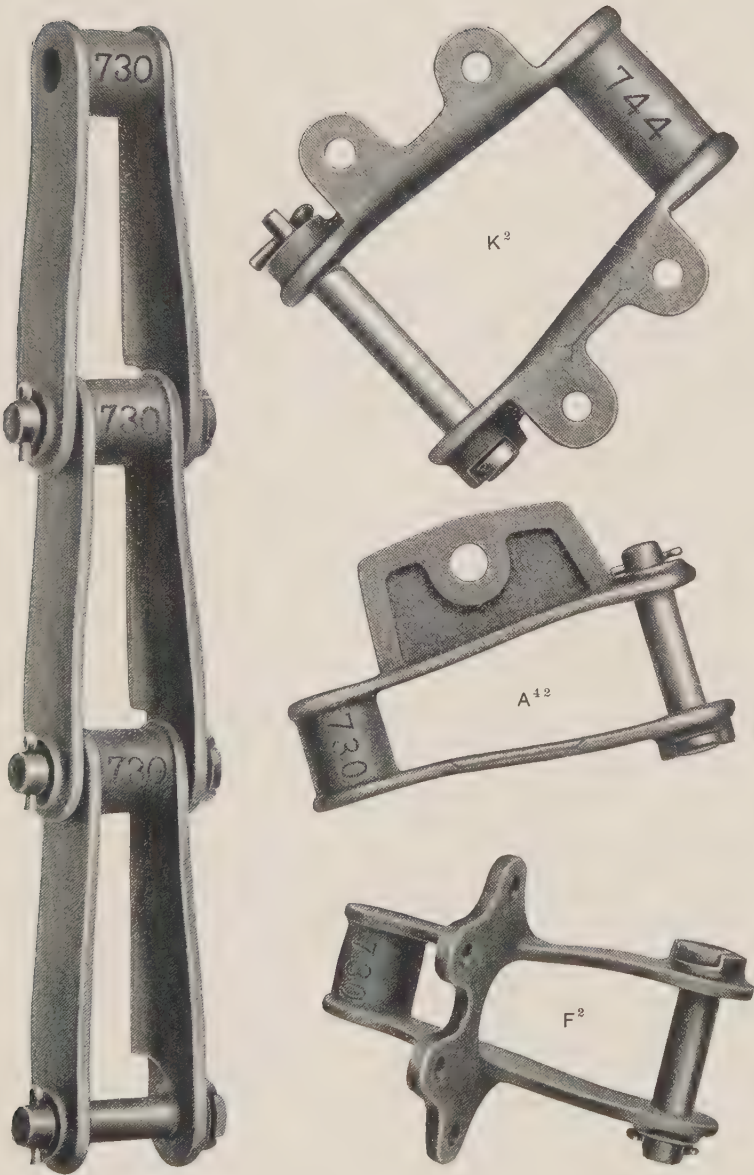
No.	Price per Foot		Pitch	Break- ing Strains	Size of Pins	Attachments
	Plain	All Attach- ments				
					Mal. iron	
710	\$0.60	\$0.75	4.72"	23,400	$\frac{1\frac{1}{8}}{16}$ "	A ⁴² , F ² , K ²
720	.45	.55	6 "	22,300	$\frac{1\frac{1}{8}}{16}$ "	F ² , K ² , M ¹⁹
730	.60	.85	6 "	24,700	$\frac{3}{4}$ "	A ⁴² , A ⁵³ , F ² , FF, G ⁶ , M ³⁴ , K ²
744	.90	1.15	6 "	31,200	$\frac{3}{4}$ "	K ²
745	1.15	1.35	9 "	50,000	$\frac{7}{8}$ "	A ⁴² , F ² , K ²
746	1.15	1.35	9 "	52,750	1 "	K ²
755	1.35	1.80	12 "	60,000	1 "	K ²

*Furnished also with steel pins at 15 cents per foot extra.

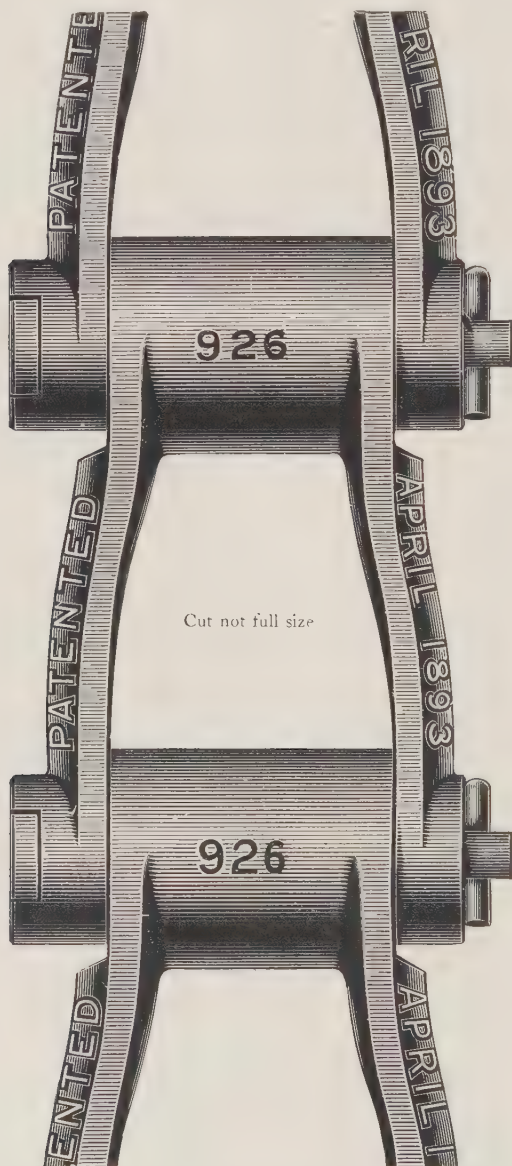
Working strains should not exceed one-sixth of the breaking strains, and should be proportioned to the service required.

For list of sprocket wheels see page 270.

Pin Chains, "700 Class"



No. 926 is a bushed chain used for power transmissions. It has reversible bushings and pins and is a most excellent chain for the purpose for which it was designed.



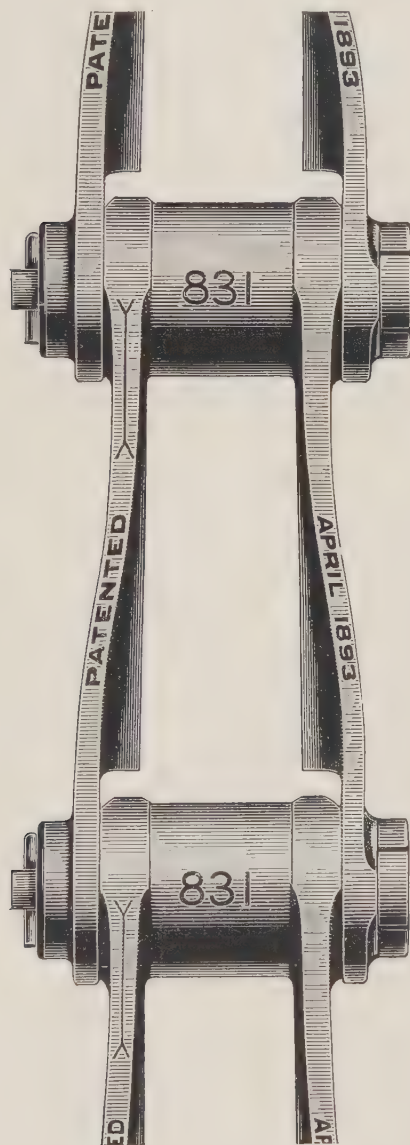
Pitch, 4 inches. Width, 4 inches. Pin, $\frac{3}{4}$ -inch steel. No Attachments.

Price per foot, \$1.30. Breaking strain, 25,780 lbs.

For working strain use same factors as shown for Ewart chains, page 212.

For list of sprocket wheels see page 270.

No. 831 is a narrow, enclosed bushed chain, which has been specially designed for double-strand elevators and conveyors.



Pitch, 6 inches. Pin, $\frac{3}{4}$ -inch steel. Breaking strain, 26,500 lbs.

Price per foot, \$1.00. Attachment, M^{18} , \$1.65 per foot.

Working strain should not exceed one-sixth of the breaking strain and should be proportioned to the service required.

Malleable Roller Chains

The advantages of a roller chain are twofold. In the first place, the *rolling* contact with the sprocket minimizes the wear on both wheel and chain. Secondly, the rollers

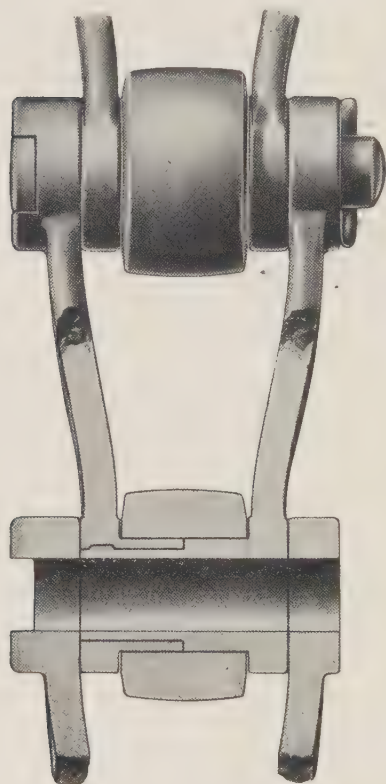
carry the chain when running on a level, with the advantage of rolling over sliding friction.

The Ewart Roller Chains fully sustain that company's reputation for careful design and excellent workmanship.

All sizes up to and including No. 1145, which is 9-inch pitch, are of the design shown on page 220.

No. 1170, 18-inch pitch, and No. 1180, which is 24-inch pitch, are of the design shown on page 221.

Attachment links are of the same general design as shown on page 215, under Pin Chains.



Registered
Rolling Chain
Trade Mark

This chain is constructed in the following manner:

The two sides of the link telescope into each other, and, fitting into corresponding recesses as shown by the accompanying illustration, are held permanently together so that the link is practically one piece. This feature, by which the side bars are permanently joined, makes a

chain which does not fall into its constituent parts when the pin is withdrawn.

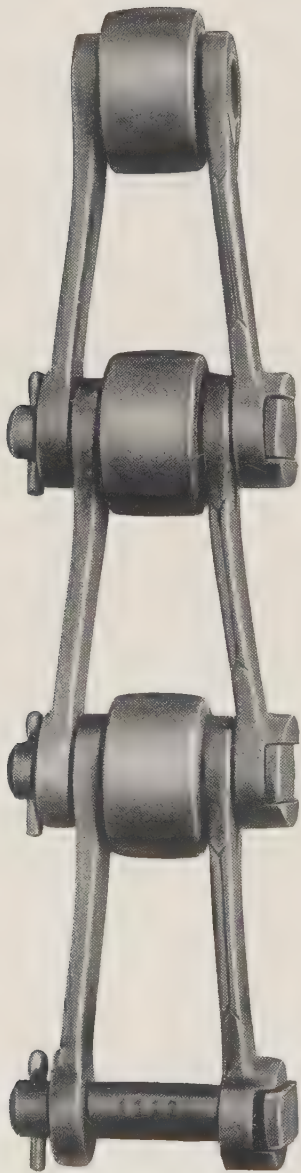
Each link is complete in itself and remains so. This permanent joint also makes it impossible for the end bar to buckle and bind the roller, preventing it from turning.

These chains are used for elevators, conveyors and power transmissions. They also lend themselves admirably to the type of combined elevator and conveyor known as the "Gravity Discharge" or "V Bucket," shown on pages 83 and 84.

The two largest sizes of roller chain have the roller proper placed midway in the link between the side bars. This permits the renewal of the roller when worn, without disconnecting the chain. To minimize the wear on the sprocket, a sleeve or roller of small diameter is also provided at the articulation points. These chains have very deep side bars and special arrangements for oiling the rollers.

By the use of the "A" attachments these chains have been very successfully used in long and high installations of the "Gravity Discharge" type elevator. A notable example is the combined elevator and conveyor encircling the dumping and reloading tracks and delivering coal to storage at the 60,000-ton coal storage plant of the Erie Railroad at Hammond, Indiana, illustrated on pages 25 and 26.

Roller Chains



No. 1112 ROLLER CHAIN
3.69-inch pitch.

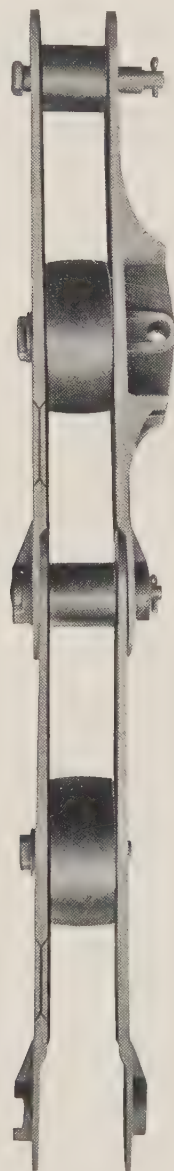


No. 1130 ROLLER CHAIN
6-inch pitch.

Roller Chains—*Continued*



No. 1170 ROLLER CHAIN
18-inch pitch.



No. 1180 ROLLER CHAIN
24-inch pitch.

LIST OF MALLEABLE ROLLER CHAINS

See illustrations on pages 218, 220 and 221

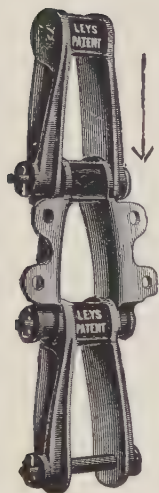
No.	Price per Foot		Pitch	Break- ing Strain	Diam- eter of Pin	Attachments
	Plain	All Attach- ments				
1112	\$0.60	\$0.85	3.69"	12,800	5/8"	A ⁴² , G ⁶ , G ¹⁹ , K ²
1113	.70	.85	4.04"	19,000	1 1/16"	A ³ , A ⁴² , A ⁷⁹ , F ² , G ⁶ , G ¹⁹ , K ²
1124	.60	.75	4 "	13,000	1/2"	M ²⁶
1130	.75	1.00	6 "	24,700	3/4"	A ²² , A ⁴² , F ² , G ⁶ , K ² , M ¹
1131	1.00	1.20	6 "	37,700	7/8"	A ⁴² , G ⁶ , M ³⁴
1145	. .	. .	9 "	29,500	3/4"	
1170	1.20	1.45	18 "	. . .	1 "	A ⁵³ , G ⁶ , G ¹⁹
1180	2.50	2.75	24 "	. .	1 1/4"	A ⁵³

Working strains should not exceed one-sixth of the breaking strains, and should be proportioned to the service required.

For list of sprocket wheels see page 272.

Ley Bushed Chain

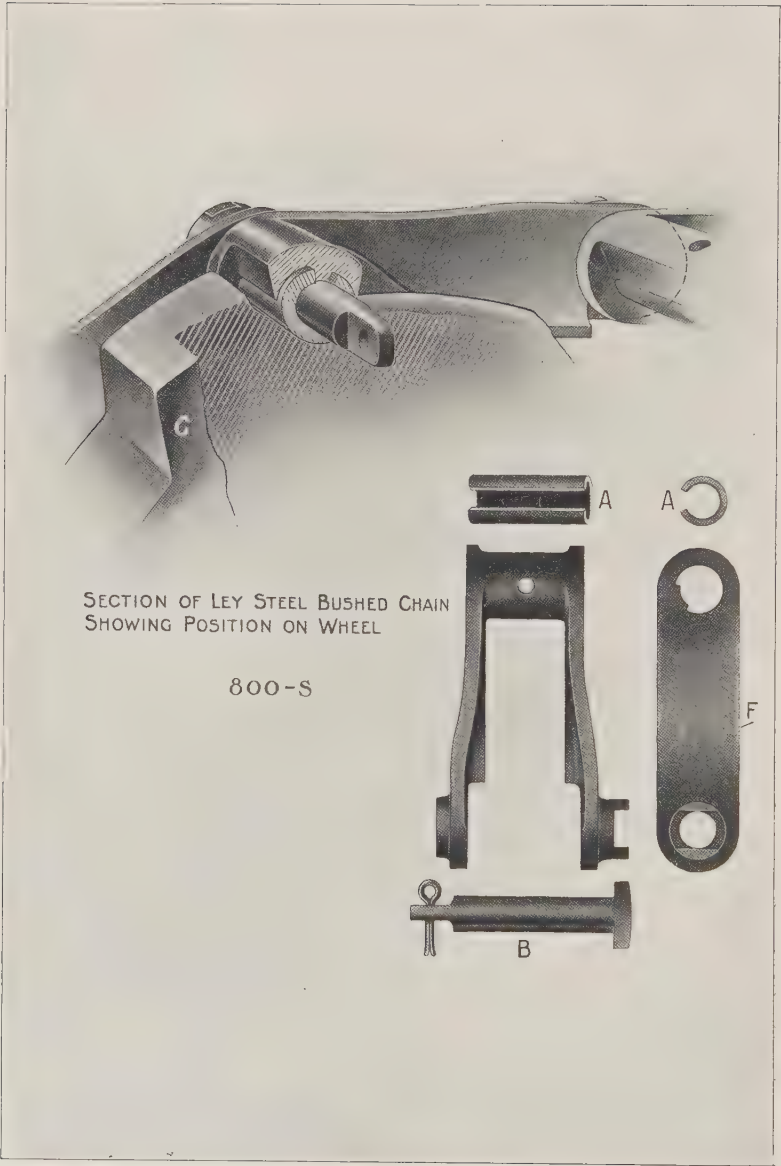
Patented



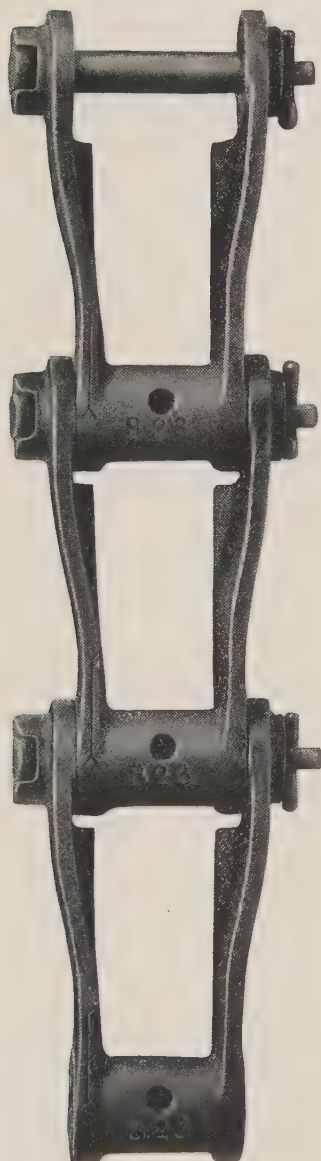
This chain meets, in a unique and complete way, the demand for a chain for use in elevating and conveying gritty materials. The difficulty with all other bushed chains is, that while *internal* wear or the wear on the pin is minimized by hardened bushings, the *external* wear due to the rubbing of the chain on the sprocket wheel, which experience shows is by far the greater of the two, is not provided for. In the Ley Bushed Chain both the *external* and *internal* wear are confined to hardened and renewable steel bushes.

Each link consists of a malleable iron frame "F," case-hardened bushing "A," and steel pin "B," shown in illustration on next page. The bridged end of the link is cut away on the under side, so that only the case-hardened bushing comes in contact with the wheel teeth. Neither bushing nor pin can turn in the link, so there is no wear of the malleable iron frame, and as both pins and bushings can be reversed when partly worn, and renewed at relatively small cost when worn out, Ley chain is practically indestructible Link-Belting. It should in all cases be run with the teeth of the wheel bearing against the outside of the bushings, as indicated by cuts on next page.

This chain is run on chilled sprocket wheels or traction wheels, which will be found listed on page 271.



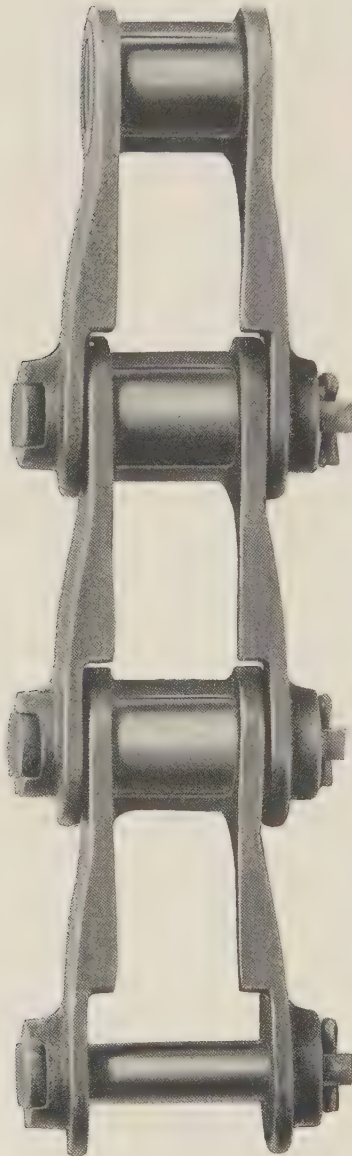
No. 823



Cut not full size

Pitch, 4 inches. Width, $3\frac{1}{2}$ inches. Pin, $\frac{1}{2}$ -inch steel. Breaking strain, 18,000 lbs.
Attachments: A⁴², F², G⁶, K².

No. 825—Back View

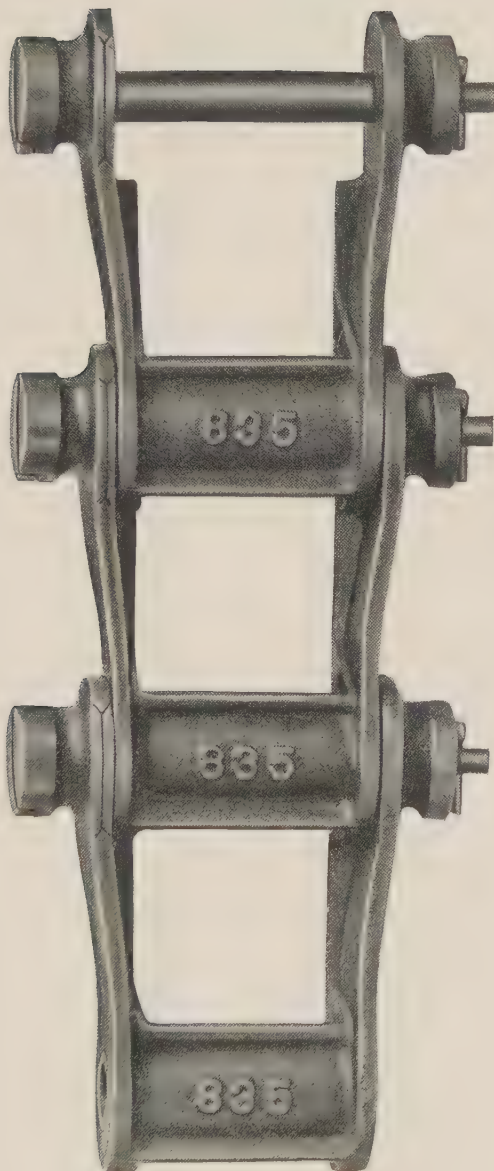


Cut not full size

Pitch, 4 inches. Width, 4 inches. Pin, $\frac{3}{4}$ -inch steel. Attachments: A^{38} , A_{2}^{42} , F^2 , G^6 , K^1 , K^2 .

Breaking strain, 28,360 lbs.

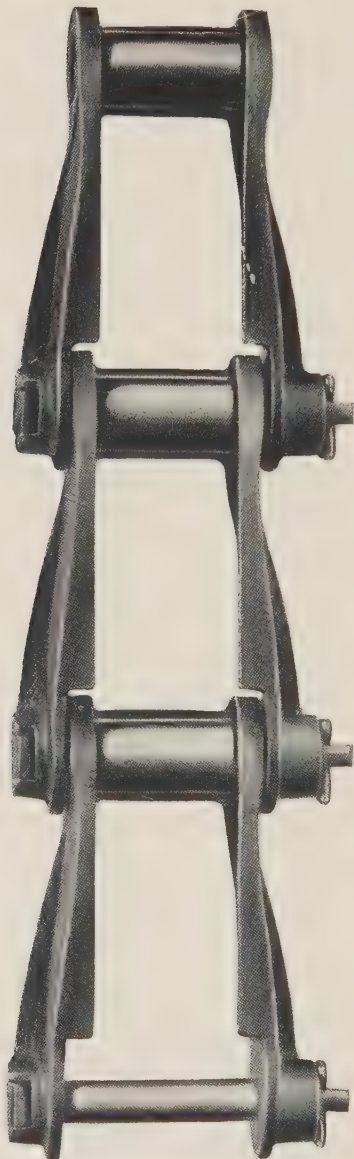
No. 835



Cut not full size

Pitch, 4 inches. Width, 6 inches. Pin, $\frac{5}{8}$ -inch steel. Attachment, K².
Breaking strain, 25,200 lbs.

No. 844—Back View



Cut not full size

Pitch, 6 inches. Width, 6 inches. Pin, $\frac{3}{4}$ -inch steel. Attachments : A⁴², K².
Breaking strain, 32,100 lbs.

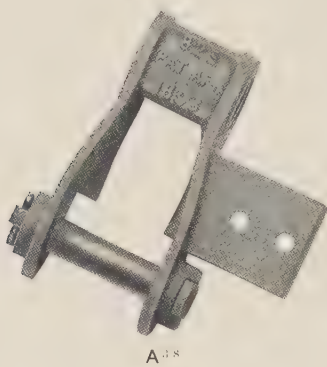
No. 846



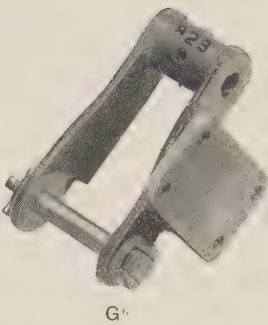
Cut not full size

Pitch, 9 inches. Width, 6 inches. Pin, $\frac{7}{8}$ -inch steel. Attachment, K².
Breaking strain, 34,000 lbs.

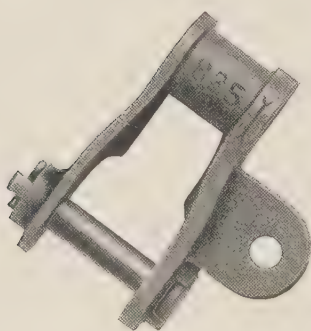
Attachments for Ley Chains



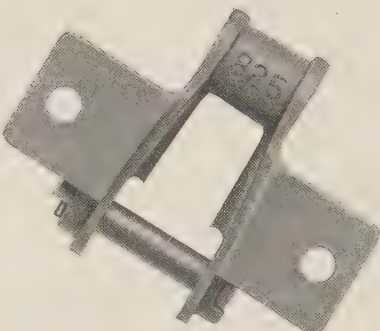
A 1/8



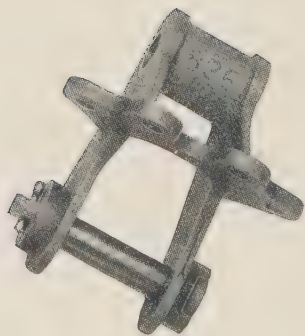
G 1



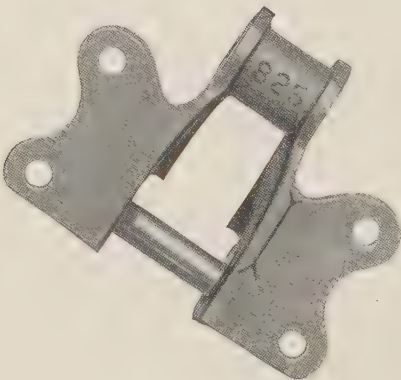
A 1/2



K 1



F 1/2



K 2

LIST OF LEY BUSHED CHAINS

No.		Pitch	Break- ing Strain	Diam- eter of Pin	Attachments
823	See page 225	4"	18,000	Steel 1/2"	A ⁴² , F ² , G ⁶ , K ²
825	See page 226	4"	28,360	3/4"	A ³⁸ , A ⁴² , F ² , G ⁶ , K ¹ , K ²
830	Not illustrated	6"	30,000	3/4"	A ⁴² , F ² , G ⁶ , K ²
835	See page 227	4"	25,200	5/8"	K ²
844	See page 228	6"	32,100	3/4"	A ⁴² , K ²
846	See page 229	9"	34,000	7/8"	K ²
847	Not illustrated	6"	54,250	1 "	K ²
855	Not illustrated	12"	53,000	7/8"	K ²

PRICE PER FOOT

No.	823	825	830	835	844	846	847	855
Plain Links	\$0.90	\$1.30		\$1.50	\$1.50	\$1.10	\$2.25	\$1.50
A ³⁸		1.50						
A ⁴²	1.30	1.90						
A ⁶⁵	1.00							
Attachments { F ²	1.30	2.00						
G ¹ or G ⁶ . .	1.30	2.10						
K ¹		1.90						
K ²	1.00	2.00		2.00	1.65	1.60	3.00	2.00
K ¹								
K ¹⁰				2.00				

Working strains should not exceed one-sixth of the breaking strains and should be proportioned to the service required.

The full line of attachments will be completed and special forms made as required.

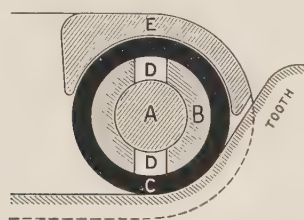
For list of wheels for Ley chains see page 271.

Ley Patent Bushed Roller Chain

It has been recognized for some years past that the most efficient drive chain for severe and heavy work is one fitted with revolving ferrules on the pins, these ferrules acting as rollers working on the teeth and the periphery of the wheels. These roller ferrules constantly present new surfaces to the teeth, thus reducing local wear and prolonging the life of the chain and wheels.

In the Ley Bushed Roller Chain, we retain all the essentially good points of the Ley Bushed Chain which has proved such a substantial success in past years, and have by recessing the interior of the cross-bar on the original Bushed Chain been enabled to introduce the roller ferrule.

This chain is made in the following sizes :



No. 823
No. 825
No. 835 and
No. 844

which are identical with the corresponding numbers of the Ley Bushed Chain shown on pages 223 to 231.

These chains will not run on the Ley Bushed Chain Wheels, but similar lists of wheel sizes are at the command of our customers.

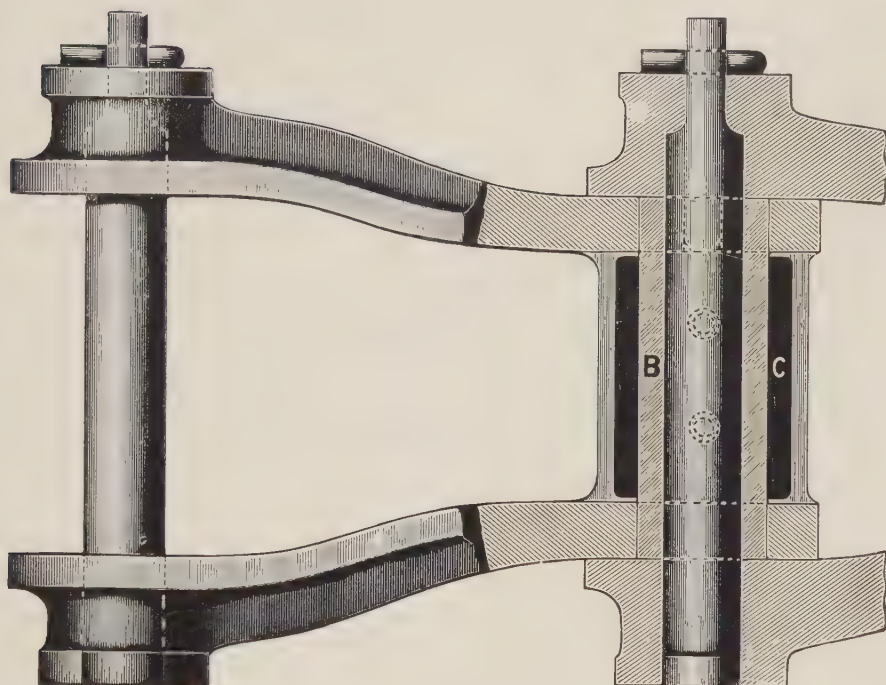
As in the Ley Bushed Chain no portion of the ductile part of the link is exposed to wear, the latter coming entirely in the pin **A**, the bush **B**, and roller **C**, and as these parts wear they can be readily replaced without having to sacrifice the link itself, and the chain again becomes equal to new.

This chain is exceptionally suitable for elevating and conveying coarse, gritty, cutting material such as ores, slag, clinkers, etc.

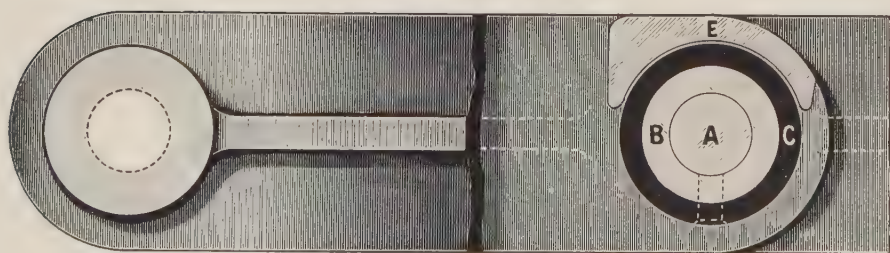
See sectional plan on page 231-b.

Prices on application.

Ley Bushed Roller Chain



SECTIONAL PLAN

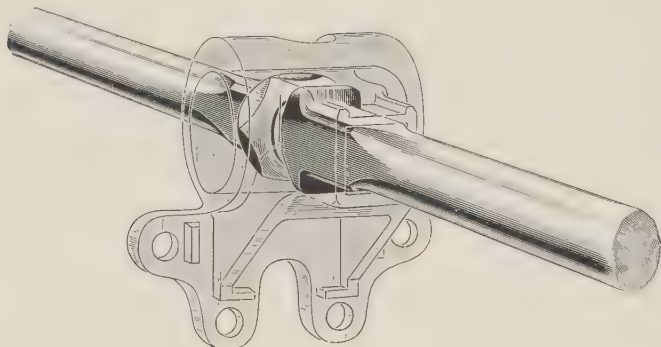


SECTIONAL SIDE VIEW

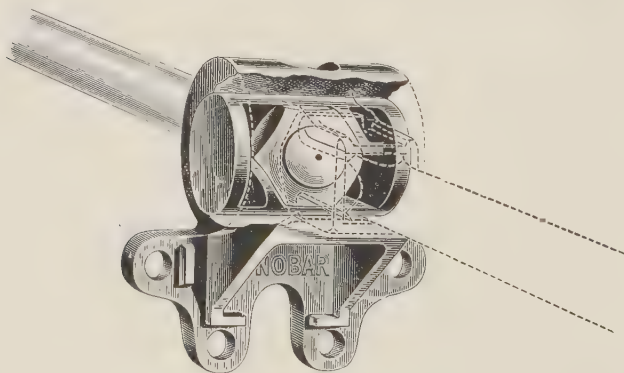
Monobar

Patented June 13, 1893

A series of bolts, flexibly connected, with attachments for conveyor flights or elevator buckets.



Wrought iron bolts in position. Malleable socket and knuckle shown in light tint.

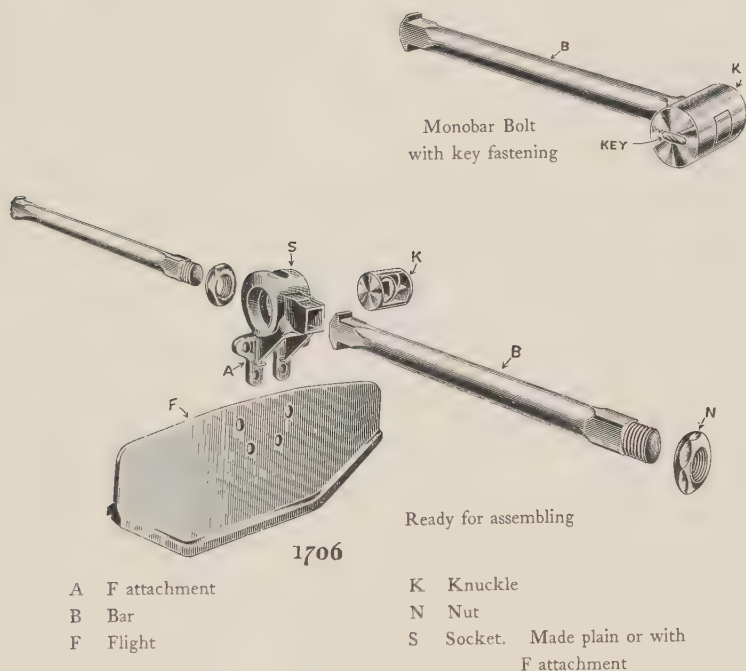


The nut on each bolt is seated in the recessed knuckle and cannot back off or change its position.

When conveying wet coal or other material that would corrode the threads, the key fastening shown in cut on next page is used.

Monobar—*Continued*

For conveying purposes is superior in all points of excellence to any chain or equivalent device in present use, and this judgment has been endorsed by its record in heavy work. It is—



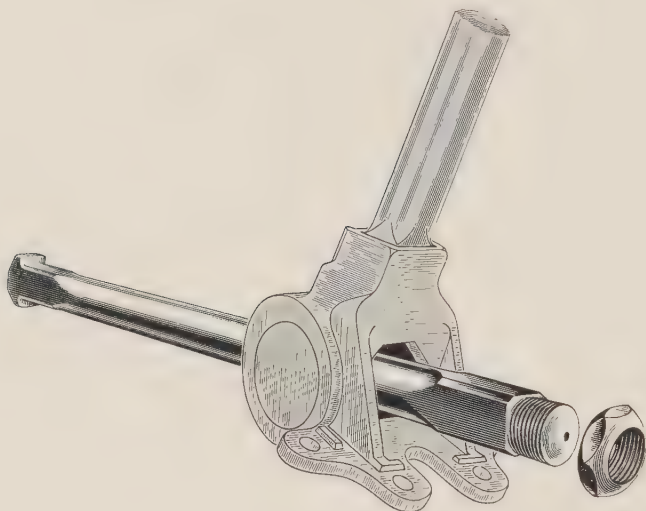
STRONG. No welds, which are the chief element of weakness in wrought chains, the malleable iron joints being properly proportioned with uniform distribution of metal. The **WORKING STRAIN** is that of high grade wrought iron bolts of the diameter employed.

LIGHT. Its design permitting use of long bolts, the knuckles, or joints, are relatively few, and it is lighter for its strength than any chain in present use.

Monobar—*Continued*

Detachable at every joint

Readily and quickly assembled or taken apart



Position for detaching or assembling

ADJUSTABLE. By turning the nut on end of each bolt the pitch is made accurate, and as the nuts are locked while in working position, this adjustment is permanent.

DURABLE. The bearing surfaces are larger than in any known chain, and are designed for free lubrication while in motion. **THERE IS ABSOLUTELY NO WEAR ON THE BOLTS**, which, therefore, need never be renewed.

INEXPENSIVE. First cost is materially less than for any chain of equivalent strength, and the bolts being permanent, expense of restoration to perfect condition is limited to cost of new joints or couplings.

As accessories to Monobar, though suitable for use with our other conveyor chains, we invite attention to

THICKENED EDGE FLIGHTS

Durable and noiseless.

WEARING SHOES FOR FLIGHTS

To increase durability and secure smooth and silent sliding on

RETURN GUIDES

Made of angle iron properly punched, bent and provided with U clamps to preserve alignment.

STAMPED STEEL CONVEYOR TROUGH

In lengths for convenient handling. This trough is absolutely flat and free from buckles and wears uniformly.

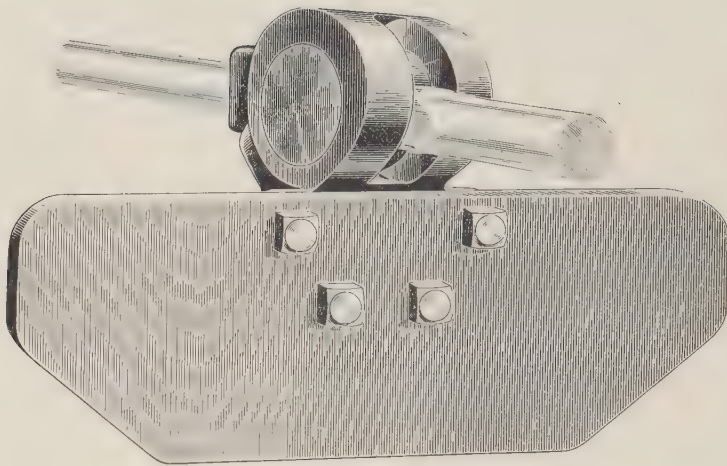
REMOVABLE TOOTH SPROCKET WHEELS

Indestructible and readily repaired at small expense by replacing worn-out teeth with new ones.

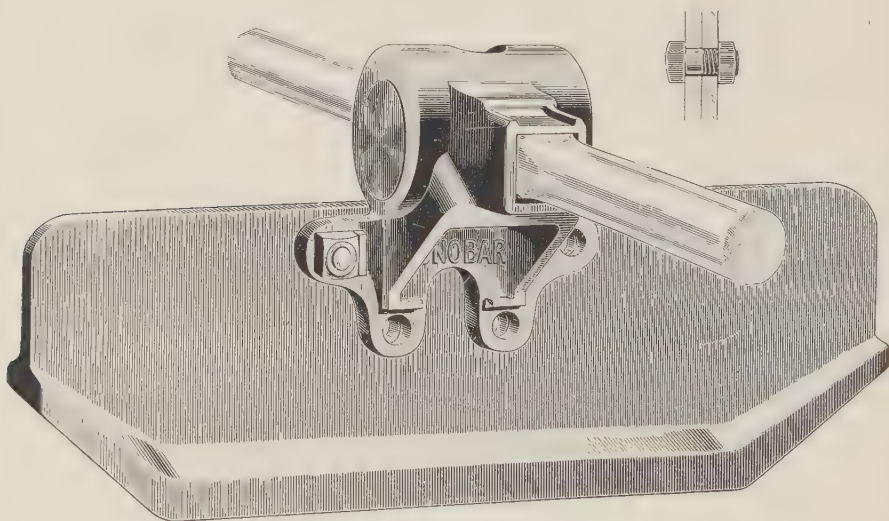
EQUALIZING GEARS

Fully described on page 173.

All of the above were designed in our works, and have been thoroughly tested for their respective duties. They are but few of the many details whose refinement has kept pace with our development of modern methods in the handling of materials.

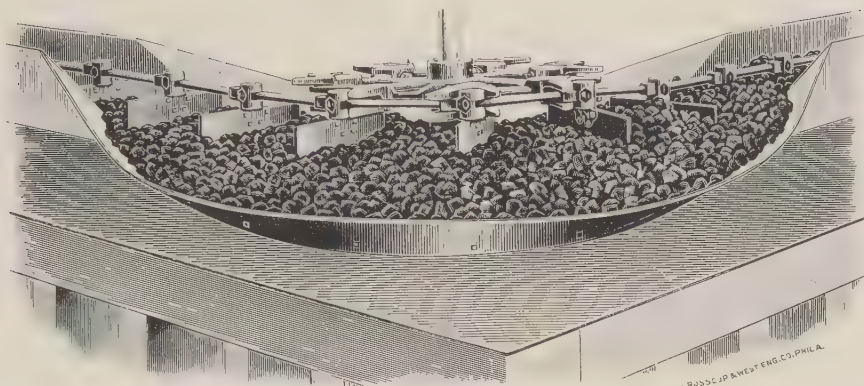


Rear view of plain flight bolted to Monobar, showing bearing surfaces for double tooth sprocket wheel, and slot in malleable socket which allows free lubrication.



Front view of thickened edge, noiseless flight bolted to Monobar. The added wearing surface of this flight makes it very durable and therefore specially suited for use with Monobar.

Horizontal Conveyors



RIGHT ANGLE OR 90 DEGREES TURN IN MONOBAR CONVEYOR

This illustration shows a condition under which Dodge Chains or Monobar are frequently required to work. The enlarged space at the turns is made necessary by the feathering action of the flights in passing around the wheel. The outwardly turned ends of the troughs (patented January 2, 1894) absolutely prevent breakage of coal or other granular material in passing from the open space into the trough. This combination of a chain with flights, running in troughs, taking different directions in the same plane, is covered by patent dated June 21, 1887.

PRICE LIST OF MONOBAR

No.	Diam. of Bolts	Pitch	Price per Foot		Breaking Strain
			Nut Bolts	Key Bolts	
612	$\frac{3}{4}$ "	12"	\$0.85	\$1.00	18,200 lbs.
618	$\frac{3}{4}$ "	18"	.65	.75	18,200 lbs.
818	1 "	18"	1.00	1.10	30,000 lbs.
824	1 "	24"	.80	.85	30,000 lbs.
1018	$1\frac{1}{4}$ "	18"	1.80	1.90	41,000 lbs.
1024	$1\frac{1}{4}$ "	24"	1.45	1.50	41,000 lbs.
1224	$1\frac{1}{2}$ "	24"	2.40	2.50	63,000 lbs.
1636	2 "	36"	3.60	3.70	120,000 lbs.

Factor of safety varies with conditions of the work to be done.

Figures in column headed "Pitch" give shortest distance between attachments.

For wheel list see page 277.

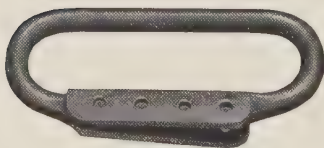
Dodge Chain



Dodge Chain is an accurately pitched cable chain in which *detachable bearing blocks* are inserted between the links. These blocks present large bearing surfaces to both links and wheel teeth, keep the links at right angles to each other, preserve the pitch of the chain, and materially increase its strength. For these reasons it is the only satisfactory cable chain to run on toothed wheels, and the only one that has ever been generally employed in long and heavily worked conveyors and elevators. The construction of the chain allows it to turn any number of angles, in any direction, in the same installation.

For this chain we have F attachments for flights; K² attachments for buckets, etc., and coupling links.

For wheel list see page 274.



SPLIT COUPLER



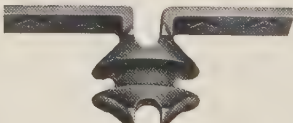
MALLEABLE
COUPLER



PLAIN BEARING
BLOCK



F. ATTACHMENT
FOR FLIGHTS



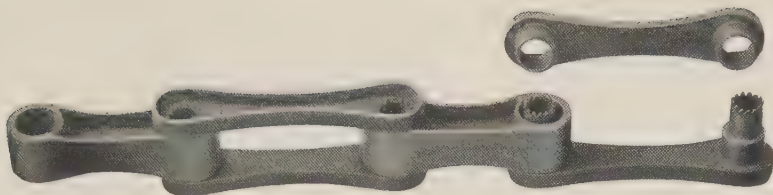
K2 ATTACHMENT
FOR BUCKETS

PRICE LIST

Size In.	Pitch In.	Working Strain	Price per foot	Bearing Block	Attachments		Split Connec'g Links	Mal- leable Couplers
					Flight	Bucket		
1/2	6	4,000	\$0.90	\$0.20	\$0.30	\$0.30	\$2.00	\$0.80
5/8	6	6,000	1.00	.20	.30	.30	2.50	.80
3/4	8	9,000	1.25	.30	.40	.40	2.50	1.20
7/8	12	12,000	1.70	.50	.70	.70	4.25	. . .
1	16	16,000	. . .	. . .	. . .	. . .	. . .	. . .

Tubular Chain

Patented



No. 1250 TUBULAR CHAIN—NON-DETACHABLE

The Tubular Chain is made in two styles—non-detachable and detachable, has large wearing surfaces, no rivets, and is especially adapted for use in elevators and conveyors doing heavy work.



No. 1350 TUBULAR CHAIN WITH G² ATTACHMENT—DETACHABLE

These chains are made of the best refined malleable iron, and have the attachment shown above.

PRICE PER FOOT

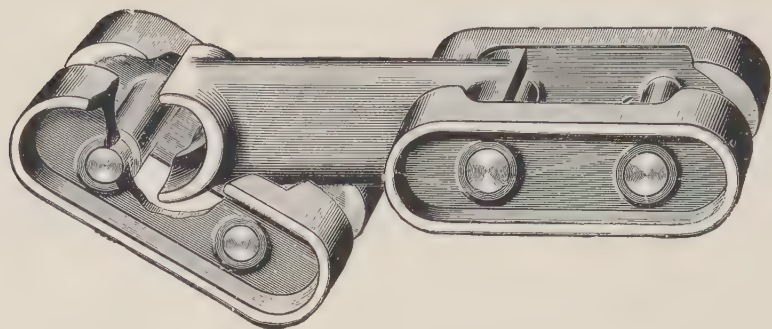
No. 1250. All plain links, \$1.10; with G² attachment, \$1.20; pitch, 12 inches; breaking strain, 24,000 lbs.

No. 1350. All plain links, \$1.20; with G² attachment, \$1.30; pitch, 12 inches; breaking strain, 30,000 lbs.

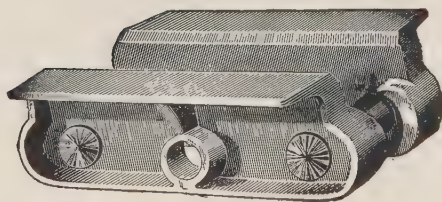
The working strain should not exceed one-sixth of the breaking strain, and should be proportioned to the service required.

For wheel list see page 275.

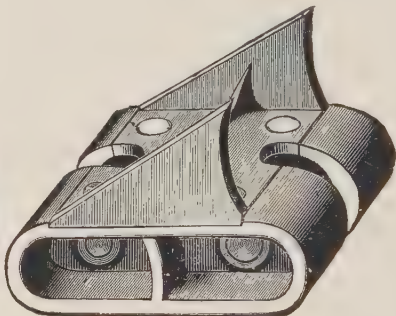
Giant Chain



The Giant is a strong detachable chain, and has been in use many years, giving entire satisfaction in car hauls, barrel elevators, log hauls, heavy apron conveyors, and other severe duties. We make Giant Chain so that rollers may be placed between the double links for use in very heavy and long slat conveyors, if so ordered. As a log haul chain it has been well appreciated by both lumber and pulp manufacturers.



K² Attachment



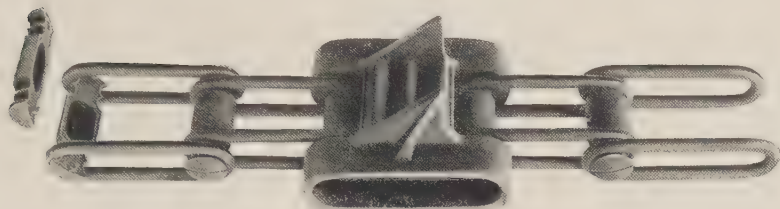
Log Tooth

PRICE LIST

Size	Pitch Coupler and Double Link	Price per Foot	Double Links, Price Each	Coupler	K ² or Slat Links	K ³	All K Attach- ments	Log Tooth	Car Haul Tooth	Break- ing Strain lbs.
600	6"	\$1.20	\$0.40	\$0.20	. . .	\$0.55	\$1.40	\$1.00	. . .	15,000
1200	12"	.90	.60	.30	\$0.80	.80	1.10	. . .	. . .	11,000
1050	10"	1.40	.85	.35	. . .	1.15	1.80	1.70	. . .	26,000
1075	10"	1.65	1.00	.40	. . .	. . .	. . .	1.85	\$2.25	40,000

Sprocket wheels for this chain are listed on page 276.

The "Howe" Detachable Wrought Iron Bull Chain, with Log Tooth



The Howe Bull Chain is composed of accurately pitched wrought iron cable links held in place by malleable iron separable pins, all links being detachable.

The log teeth, which are inserted five feet apart, are made in one solid piece without screws or rivets to work loose and cause trouble.

The Howe Bull Chain is the simplest and most durable that has ever been produced; this statement is borne out by the increasing demand and popular favor which it has met since it was first put into service in 1884.

$\frac{5}{8}$ -inch chain; working strain, 12,000 lbs.; breaking strain, 42,000 lbs.

Price, \$1.50 per foot.

$\frac{3}{4}$ -inch chain; working strain, 18,000 lbs.

Price, \$2.50 per foot.

Log tooth every five feet.

Sprocket wheels for this chain are listed on page 275.

No. 500 Steeple Top Chain

Patented



The No. 500 Steeple Top Chain is designed for horizontally transferring packages, barrels, sheet, skelp and bar iron, lumber, etc. In the lumber mills, oil refineries and rolling mills, where it has been extensively used, it has given entire satisfaction.

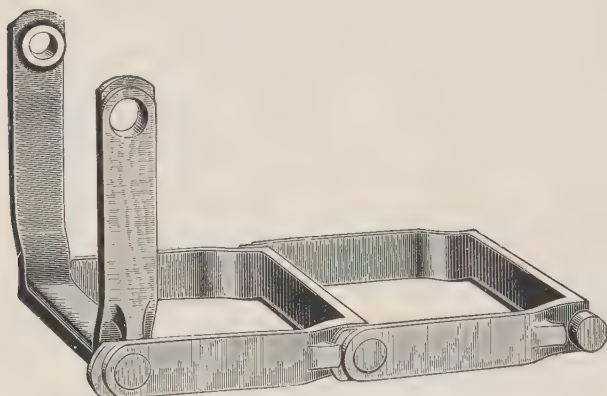
Two or more parallel strands are run in channels. The top only projecting above the channel, permits the material to be loaded upon and taken from it transversely. Its working strain is 2,000 lbs., breaking strain, 10,000 lbs.

Price, 65 cents per foot.

Sprocket wheels for this chain are listed on page 276.

No. 550 Detachable Sawdust Carrier

Patented

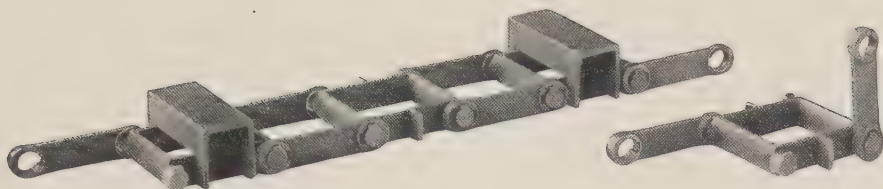


No. 550 chain is an economical carrier embodying the detachable feature, and is well adapted for horizontal conveyors of small capacity handling sawdust, tan bark, etc. It is 7 inches wide, 6-inch pitch and has an ultimate strength of 7,800 lbs. Price per foot, 50 cents.

Sprocket wheels for this chain are listed on page 276.

Block Chain

Patented



Designed for use in inclined and horizontal conveyors, where a strong pushing action is required, as the "H" or box links, which are placed in the chain at intervals, carry everything before them.

Made in two sizes :

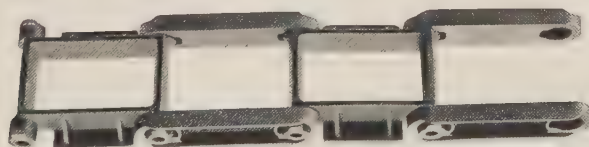
No. 575—4-inch pitch ; 4 inches wide ; side bars, 1 inch high ; breaking strain, 9,000 lbs.
Price, 50 cents per foot.

No. 580—5-inch pitch ; $6\frac{3}{8}$ inches wide ; side bars, $1\frac{1}{2}$ inches high ; breaking strain, 16,000 lbs. Price, 65 cents per foot.

These chains are run in hardwood troughs, with inclined sides. Grooves for chains should be made one-half inch wider than chain.

"H" attachments for No. 580 chain are $1\frac{1}{2}$ inches high and are placed 8 feet apart, unless otherwise ordered.

No. 585 Reinforced Block Chain

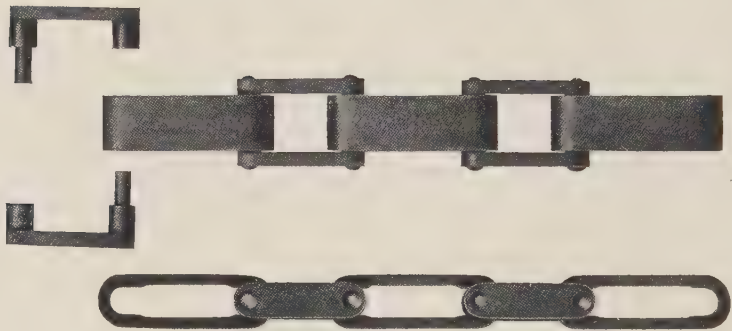


The chain illustrated in this cut is of heavier pattern than the Nos. 575 and 580 block chain illustrated above and is provided with sliding surfaces. The chain is 5-inch pitch, 5 inches wide and $1\frac{3}{4}$ inches deep. Breaking strain, 16,000 lbs.

Price, 70 cents per foot.

Sprocket wheels for these chains are listed on page 276.

No. 1260 Cane Conductor Chain



The side bars of the chain, as shown in the cut, are made to telescope into each other, relieving the rivet of all shearing strain and making it serve only to hold the side bars together. It may therefore be made small enough to be easily headed up cold and driven out when necessary. This results in a stiff and permanent chain, but one which is readily detachable. It has been largely used for cane carrier service.

Pitch (2 links), $6\frac{3}{8}$ inches. Breaking strain, 17,000 lbs.

Price on application.

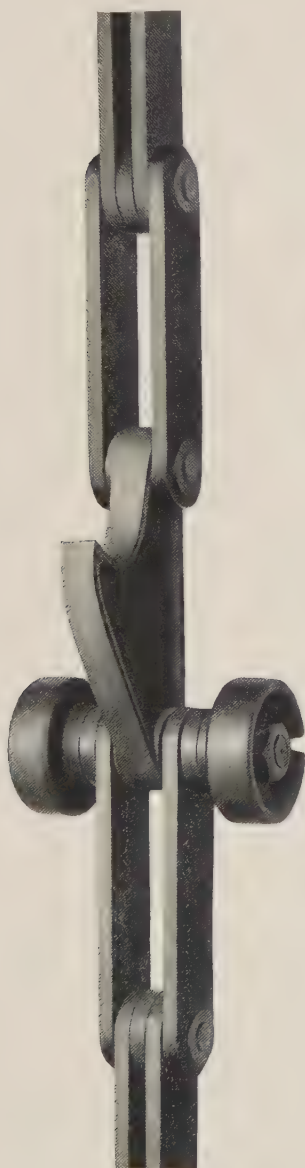
Sprocket wheels for this chain are listed on page 276.

Car Haul Chains

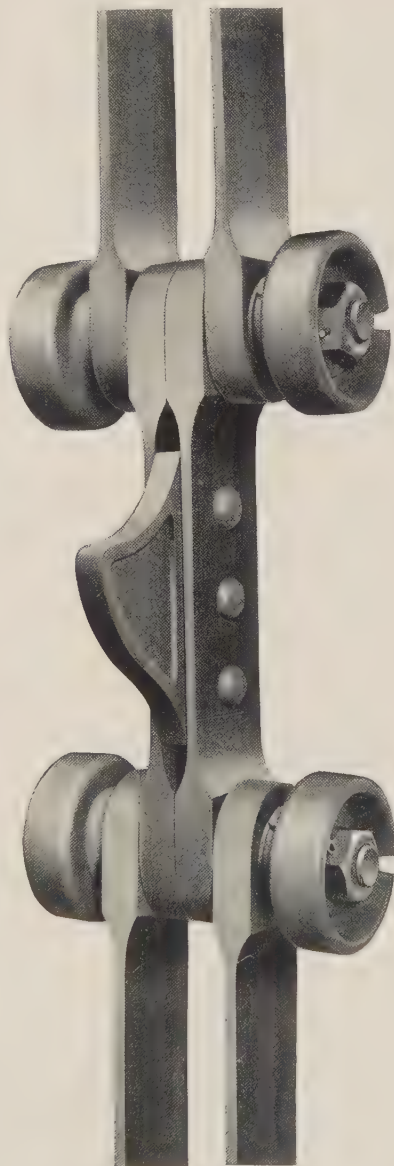
Car Haul Chains are made of two types. Type "A" is used for light and type "B" for heavy service.

Links and pins are proportioned both for strength and bearing surface, excessive pressure being avoided by increasing joint areas.

Price on application.

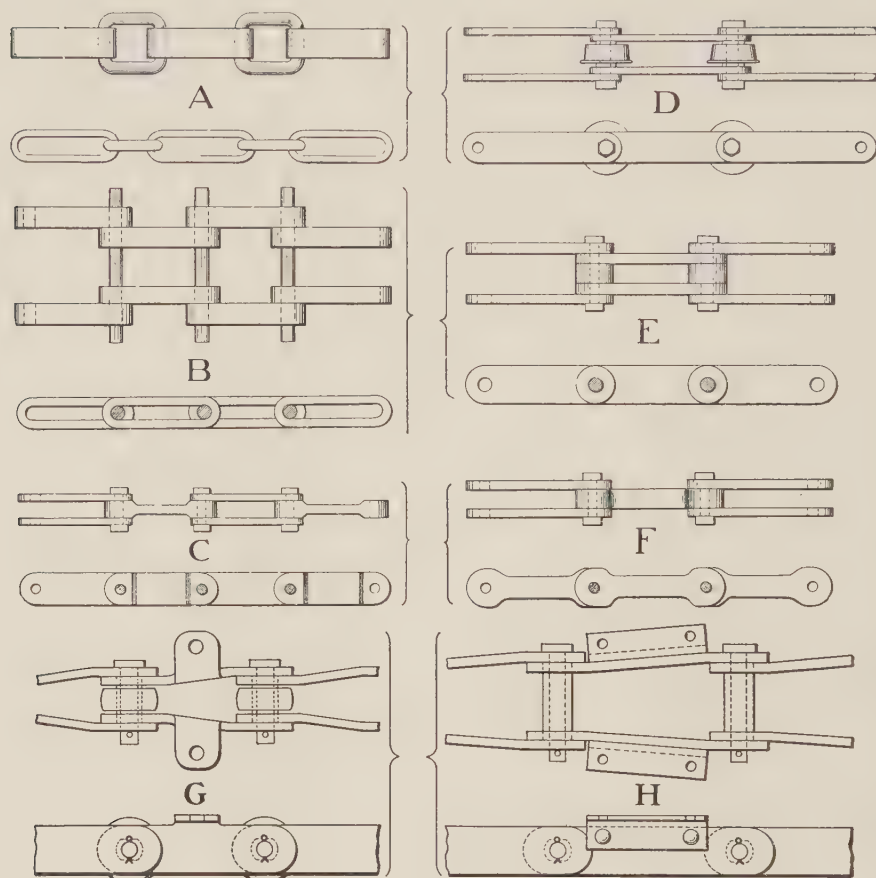


TYPE "A"



TYPE "B"

Miscellaneous Chains



Above are illustrated a few forms of special chains which we make in sizes to meet requirements.

A. Cane conductor chain. Very accurately pitched and of best refined wrought iron.

B. Link and spindle chain. Chiefly used for continuous bucket coal elevators of large capacity.

C. Steel one and two-bar chain. Ends of center link enlarged to increase pin and sprocket wearing surface.

D. Two and two-strap link chain with rollers. For long carriers.

E. Two and two-strap link chain with spacers.

F. A strong and durable steel chain for miscellaneous heavy work.

G. Steel link roller chain with steel pin and bush.

H. Steel link chain with steel pin and bush. For elevator use.

The Renold Silent Chain Gear

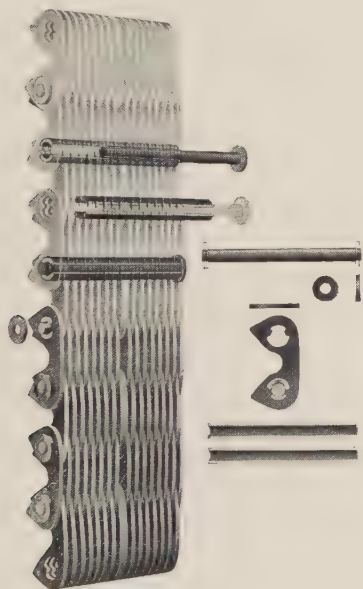
Patented

This epoch-making device is remarkable in that it may be run quietly at high speeds.

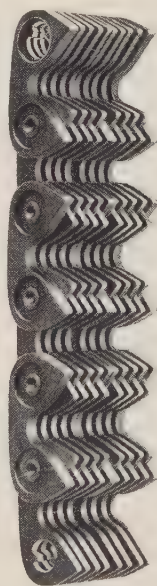
The surfaces in the joint which move with reference to each other, are case-hardened steel, and the link merely transmits the tensile strain and locks rotating parts in position. Elongation is therefore reduced to a minimum.

The chain is being manufactured in this country by the Ewart Manufacturing Company in a special plant.

The application of the chain to machines and engineering uses will be in the hands of the Link-Belt Companies.



$\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ -inch pitches



1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ and 2-inch pitches

THE RENOLD SILENT CHAIN GEAR. Can be run at high speeds. Is equally perfect in its action with a new chain or with an old one. Will transmit any amount of power. Gives a positive velocity ratio. Can be used on short centers. Can be used in a hot place, or in a damp place. Does away with excessive journal friction. Will run in either direction.

THE RENOLD SILENT CHAIN GEAR is superior to leather or rubber belting because—It cannot slip. It can be run on short centers. It can be used in a hot place, or in a damp place. It is run slack and there is therefore no excessive journal friction. There is no danger of sparking.

(Continued on page 248)

The Renold Silent Chain Gear—*Continued*

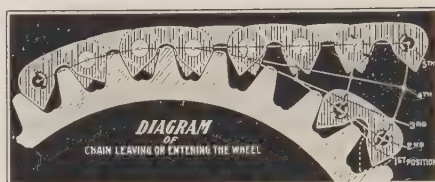
It is superior to spur gearing because—It is quiet. It may be run at high speeds. It does not require short centers. There is no sliding contact, see cut. The action is smoother and the drive is more durable.

It has been extensively used for the spindles and feeds on machine tools, for motor driving, for engine and turbine governors, for special machinery, and for power transmissions of all sizes and varieties.

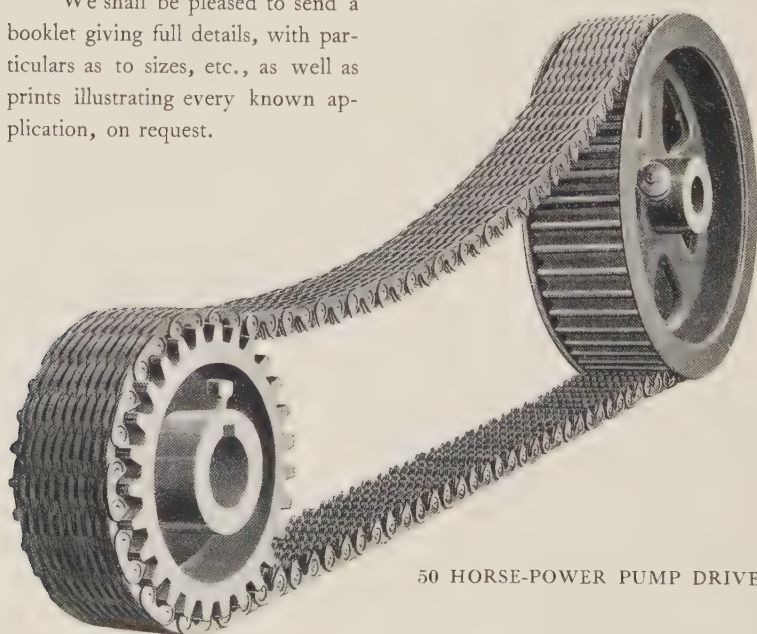
Any amount of power may be transmitted by it.

It is not experimental, having seen a number of years' successful service in this country.

We shall be pleased to send a booklet giving full details, with particulars as to sizes, etc., as well as prints illustrating every known application, on request.



THE ACTION OF THE SILENT CHAIN



50 HORSE-POWER PUMP DRIVE

The Link-Belt Safety Curved Front Elevator Boot

Patented

Our Elevator Boots have the following points of superiority :

First—The chute end, being longer and wider than the back, gives free escape for loaded buckets, effectually preventing jamming or breaking of material.

Second—Take-up screws are connected by Ewart Link-Belting, insuring the same movement up and down of both ends of the shaft.

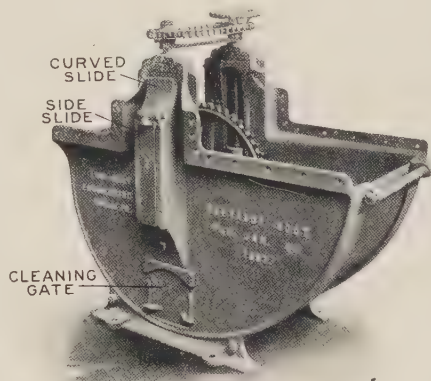
Third—Hollow take-up screws, through which oil is carried to the bearings, allowing the boot to be—

Fourth—Entirely closed, and practically dust-tight.

Fifth—Tight cleaning doors, having no bolts, and consequently easy to remove.

Sixth—A safety device, for securing the nuts of the take-up screws, making serious breakage impossible.

This type of boot is used for open elevators or those enclosed by wooden casings.



PRICE LIST SAFETY CURVED FRONT ELEVATOR BOOTS

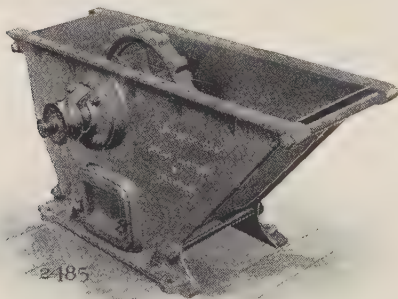
WITHOUT SHAFT, WHEEL AND COLLARS

No.	Projection of Bucket	PRICE
		Without Shaft, Wheel and Collars
5	Up to 4"	\$21.00
7	Up to 6"	40.00
9	Up to 8"	58.50
12	Up to 10"	79.00
15	Up to 12"	114.00
18	Up to 12"	176.00

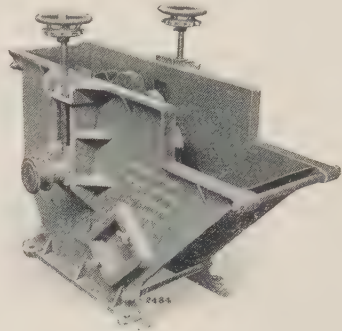
For detailed dimensions see page 308.

The Link-Belt Safety Straight Front Elevator Boots

The Straight Front Boots are employed in elevators equipped with steel casings, and particularly those handling dusty and gritty materials. They are absolutely dust-proof; the bearings are protected from the material handled by the buckets, are self-aligning and are provided with oil well. The inside of each door is flush, which renders it impossible for material to catch on same. The slope of the front is sufficiently steep to prevent material accumulating on it.



“FIXED-BEARING” TYPE



“TAKE-UP” TYPE

The Take-Up style, as shown by cut No. 2484, is used for fixed head elevators, while the Fixed-Bearing type, shown by cut No. 2485, is used where the head shaft is carried in adjustable bearings. See page 313.

We make these boots in two styles as illustrated and described above, and in three sizes as listed below :

PRICE LIST SAFETY STRAIGHT FRONT ELEVATOR BOOTS

WITHOUT SHAFT, WHEEL AND COLLARS

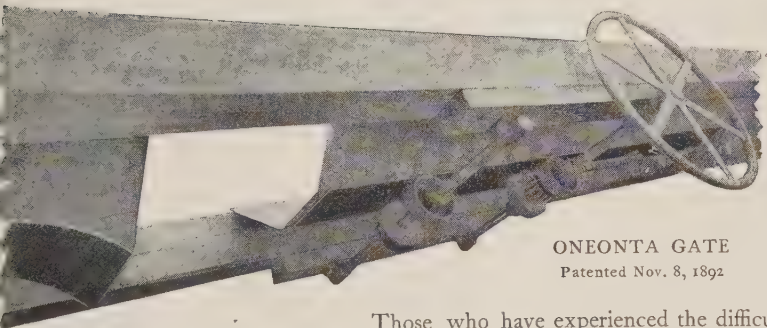
TAKE-UP TYPE			FIXED-BEARING TYPE		
No. *	PRICE Without Shaft, Wheel and Collars	Projection of Bucket	No. *	PRICE Without Shaft, Wheel and Collars	Projection of Bucket
16½	\$52.00	Up to 8"	16½	\$36.00	Up to 8"
20½	60.00	Up to 10"	20½	44.00	Up to 10"
22½	72.00	Up to 12"	22½	56.00	Up to 12"

* Distance from center of shaft to inside of sheet at bottom of boot—see dimension “R,” page 309.
For detailed dimensions see page 309.

Discharge Gates for Conveyors



LINK-BELT GATE
Patented Jan. 3, 1893



ONEONTA GATE
Patented Nov. 8, 1892

Those who have experienced the difficulties incident to the operation of discharge gates of the ordinary types will recognize the advantages of these improved forms, which are the best that have been devised for their respective purposes. The Oneonta gate will discharge lump material of any size that it is possible to convey, as the separation of the trough is complete from side to side, the flights being guided into the trough after passing the opening by the bell mouth.

The Link-Belt gate is thoroughly efficient in handling fine material and moderate sized lumps, and is constructed to be operated with rack and pinion, in the same way as the Oneonta gate.

Both forms of gates can be opened and closed while the conveyor is in operation, which is a very desirable feature, effecting a great saving of time.

PRICE LIST

Size	Link-Belt Gate	Oneonta Gate	Size	Link-Belt Gate	Oneonta Gate
4 x 10	\$13.00	.....	6 x 12	\$14.00	.....
4 x 12	13.50	.....	6 x 18	18.00	\$55.00
5 x 10	13.00	.....	8 x 18	18.00	57.50
5 x 12	13.50	.....	8 x 20	21.00	60.00
5 x 15	15.00	.....	8 x 24	22.50	62.50

Price of trough to be added.

Standard Drop Forged Steel Conveyor Trough

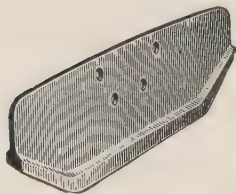
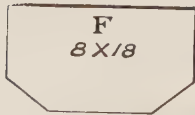
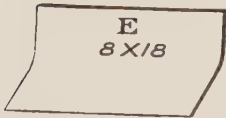
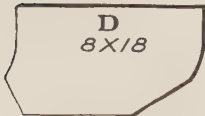
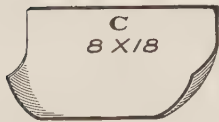


THE JOINT

The Standard Trough is made in sections two feet long and of widths to fit all our Standard Flights. It is drop forged in dies, making it absolutely true and flat on the bottom and sides, insuring uniform wear over its surface and making it the most durable conveyor trough ever placed on the market. The sections can easily be handled by one man.

PRICE LIST

Size of Flight	Price per Foot	Size of Flight	Price per Foot
4 x 10	\$0.65	6 x 12	\$0.95
4 x 12	.75	6 x 18	1.15
5 x 10	.80	8 x 18	1.30
5 x 12	.85	8 x 20	1.40
5 x 15	.90	8 x 24	1.50



Conveyor Flights

All our steel flights are drop forged in dies, and have all holes punched at one operation, making them uniform. The curves are those which have been adopted after several years of experience. The style C is curved in both its surface dimensions, thereby making a noiseless and strong scraper.

For carrying capacity of flights, see page 299.

PRICE LIST STEEL FLIGHTS

Styles C, D, E, F, or Plain Scrapers

Size	Price	Size	Price
4 x 10	\$0.20	6 x 12	\$0.30
4 x 12	.22	6 x 18	.40
5 x 10	.23	8 x 18	.60
5 x 12	.25	8 x 20	.65
5 x 15	.30	8 x 24	.75

Malleable iron flights are stiff and strong and have thickened wearing edges, greatly increasing durability.

PRICE LIST MALLEABLE IRON FLIGHTS

Size	Price	Size	Price
4 x 10	\$0.40	6 x 18	\$0.90
4 x 12	.45	8 x 18	1.35
5 x 10	.50	8 x 20	1.45
5 x 12	.55	8 x 24	1.95
5 x 15	.60		

Wearing shoes for flights (for sliding on return guides), either riveted on or with bolts, per flight, 30 cents.

Bolts, for securing flights to Monobar, per hundred, \$2.40.

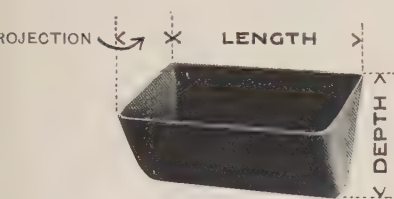
Malleable Iron Buckets

Our malleable iron buckets are seamless, strong and smooth, and their rounded corners guarantee free delivery of the material handled. They are

made in four styles, as shown, A, AA, B and C, and of the sizes given in price list.

Style A is adapted to the handling of ear corn, cement, coal, phosphate, chemicals, pulp, etc. Style AA has heavy reinforced front edges and corners, which increase the life of the bucket in handling materials of a silicious nature. Style B is used for handling ores, stone, etc., in inclined elevators. Style C is especially adapted for

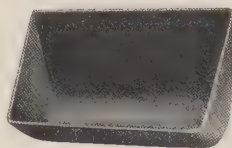
sugar, clay and sticky materials. No charge is made for punching.



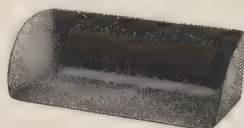
STYLE A



STYLE AA

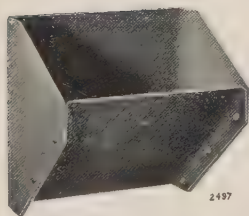


STYLE B

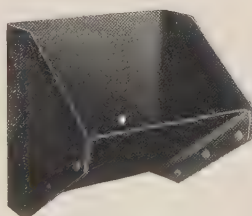


STYLE C

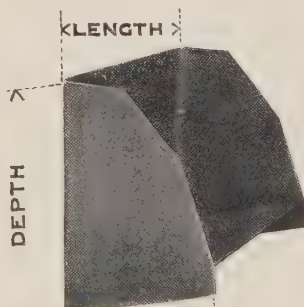
Steel Elevator Buckets



HIGH FRONT



MEDIUM FRONT



LOW FRONT

Elevator buckets of this type are made of heavy steel plate; are very strong and admirably adapted for handling coal, rock, ore, or any rough material in large quantities and under severe conditions. Special sizes, shapes and thicknesses made to order, prices for which will be quoted upon application.

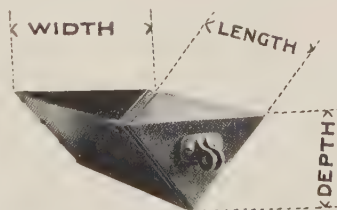
For list and dimensions of Steel Elevator Buckets, see pages 255, 256 and 321.



MALLEABLE END BUCKET



SALEM BUCKET



GRAVITY DISCHARGE

List of Steel Elevator Buckets—*Continued*

Style	Length	Width	Depth	Gauge of Steel	Maximum Carrying Capacity (Level Full) in Cubic Inches
GRAVITY DISCHARGE	12"	12"	6"	No. 12, 10	432
	16"	12"	6"	No. 12, 10	576
	18"	12"	6"	No. 12, 10	648
	16"	16"	8"	No. 10	1024
	20"	16"	8"	No. 10	1280
	20"	20"	10"	No. 10 and $\frac{3}{16}$ "	2000
	24"	20"	10"	No. 10 and $\frac{3}{16}$ "	2400
	30"	20"	10"	No. 10 and $\frac{3}{16}$ "	3000
	24"	22"	11"	$\frac{3}{16}$ " $\frac{3}{16}$ "	2904
	30"	22"	11"	$\frac{3}{16}$ " $\frac{3}{16}$ "	3630
	36"	22"	11"	$\frac{3}{16}$ " $\frac{3}{16}$ "	4356
	24"	24"	12"	Made to Order	3456
	30"	24"	12"	Made to Order	4320
	36"	24"	12"	Made to Order	5184

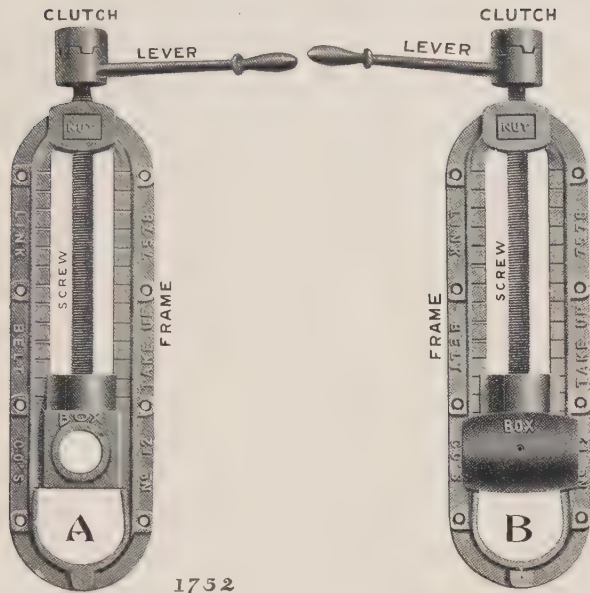
PRICE LIST OF "SALEM" BUCKETS

Size	Maximum Capacity in cu. in.	Gauge of Steel	Price	Size	Maximum Capacity in cu. in.	Gauge of Steel	Price
2 x 2	3	25	\$0.04	11 x 6	240	18	\$0.65
2½ x 2¼	7	24	.05	12 x 6	262	18	.68
3 x 2½	10	24	.06	14 x 6	306	18	.74
3½ x 2½	12	24	.07	16 x 6	349	18	.81
3 x 3	15	23	.09	18 x 6	393	18	.89
3½ x 3	18	23	.10	20 x 6	447	18	.95
4 x 3	20	23	.11	10 x 7	284	18	.73
4½ x 3	23	23	.12	11 x 7	313	18	.76
4 x 3½	28	22	.12	12 x 7	341	18	.80
4½ x 3½	32	22	.13	14 x 7	398	18	.88
5 x 3½	36	22	.14	16 x 7	455	18	.96
5 x 4	41	22	.18	18 x 7	512	18	1.04
5½ x 4	44	21	.19	20 x 7	569	18	1.12
6 x 4	49	21	.20	16 x 8	570	18	1.14
7 x 4½	89	20	.30	18 x 8	640	18	1.22
8 x 5	120	19	.41	20 x 8	713	18	1.30
9 x 5	135	19	.43	22 x 8	784	18	1.38
10 x 5½	174	19	.54	24 x 8	855	18	1.46
10 x 6	213	18	.62				

NOTE.—These buckets will be made of heavier gauge when so ordered.

In calculating elevator capacities, do not use more than $\frac{3}{4}$ of the above maximum capacities, which are the cubic contents of the buckets.

“Take-Ups”



1752

Made in two styles, A and B, as shown. No. 4 has screw with squared end for wrench. All other sizes made with clutch handles unless otherwise ordered.

The number of the “Take-Up” indicates its length of adjustment in inches.

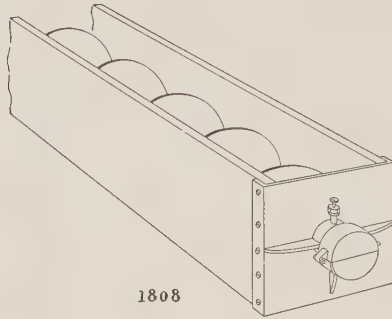
PRICE LIST

No. of Frame	Diameter of Shaft	Price each, A or B	No. of Frame	Diameter of Shaft	Price each, A or B
4	$\frac{11}{16}$	\$1.75	16	$2\frac{11}{16}$	\$12.50
4	$\frac{13}{16}$	1.90	16	$2\frac{13}{16}$	12.75
4	$\frac{15}{16}$	2.00	20	$2\frac{7}{8}$	13.75
5	$1\frac{1}{8}$	2.55	20	$2\frac{9}{16}$	14.00
5	$1\frac{1}{4}$	2.70	20	$2\frac{11}{16}$	15.00
7	$1\frac{7}{8}$	3.75	20	$2\frac{13}{16}$	15.25
7	$1\frac{9}{16}$	4.00	20	$2\frac{15}{16}$	15.50
7	$1\frac{11}{16}$	4.25	24	$2\frac{17}{16}$	23.00
9	$1\frac{15}{16}$	5.75	24	$3\frac{1}{8}$	24.50
9	$2\frac{1}{8}$	6.00	24	$3\frac{1}{16}$	25.00
12	$2\frac{3}{8}$	7.75	36	$3\frac{1}{2}$	34.50
12	$2\frac{5}{8}$	7.90	48	$3\frac{13}{16}$	40.00
12	$2\frac{7}{8}$	8.00	60	$3\frac{15}{16}$	47.00
16	$2\frac{3}{4}$	11.50	72	$4\frac{1}{8}$	82.50
16	$2\frac{7}{8}$	12.00			

For detailed dimensions see page 314.

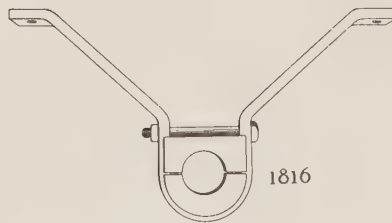
NOTE.—In ordering, give diameter of shaft for which “Take-Up” is desired.

Thrust Bearing for Screw Conveyors



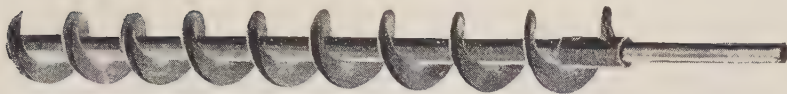
Thrust bearings are regularly furnished with all screw conveyor installations of our design. They consist of a series of brass and steel washers operating in an enclosed oil chamber, as shown in the cut. Thrust boxes are placed on the outside of conveyors and are furnished either in connection with cast iron ends for screw conveyor casings or separately in connection with repairing only.

Chilled Bearing for Screw Conveyors

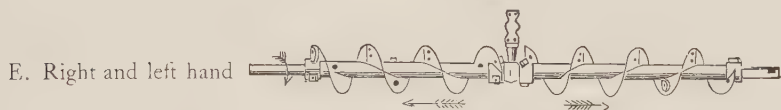


These bearings have been designed especially for use in gritty materials, and are employed in connection with screw conveyors having renewable hardened steel journals. They are so constructed as to be readily replaced.

Screw Conveyor



We supply, upon short notice, this conveyor mounted upon hollow shafts, as shown above, or with extra heavy flights, mounted upon a solid shaft and with fittings to match. Order by the letter and names indicated below.



PRICE LIST OF SCREW CONVEYOR AS USUALLY MADE AND MOUNTED ON HOLLOW SHAFTS

Diam. in Inches	Standard Length	Inside Diam. of Hollow Shaft	Maximum Speed R. P. M.	Capacity Cu. Ft. per minute at 100 R. P. M.	Price per Foot Steel Flights	Price per Foot Galvanized Iron
4	8'	1 "	100	.8	\$1.00	\$1.28
6	10'	1½"	140	2.7	1.67	2.03
9	10'	1½"	150	10	2.00	2.68
12	12'	2 "	160	24	2.80	3.48
16	12'	2 "	160	55	3.75	4.83
16	12'	3 "	160	55	5.08	6.38
18	12'	3 "	160	90	6.15	7.79

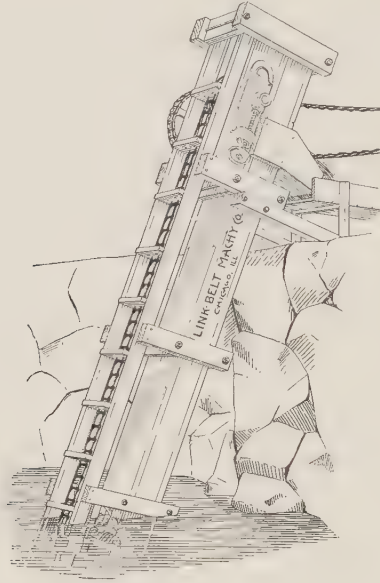
These prices include hangers, curved sheet-iron lining, couplings and bolts, complete. If hangers or linings are not desired, deduct for either, per foot of conveyor: 4-inch, 2½c; 6-inch, 3½c; 9-inch, 5c; 12-inch, 10c; 16-inch, 15c; 18-inch, 20c.

For cast-iron screw conveyors see page 118.

NOTE.—Above speeds and capacities are for conveyors handling grains, and are for troughs filled nearly to shafts.

Link-Belt Box Water Elevator

has been for twelve years successfully employed lifting water in the irrigation districts of Colorado, Montana, Washington, Oregon, Kansas, Nebraska, South Dakota, etc.



PRICE LIST

Number of Elevator	Gallons per Minute	Steam Horse Power for 10 Ft. Lift	Price of Elevator Complete with Wood Work but without Driving Machinery				
			10 Ft.	15 Ft.	20 Ft.	25 Ft.	30 Ft.
1	300	1	\$77.00	\$95.00	\$119.00	\$134.00	\$149.00
2	600	2	97.00	115.50	140.00	156.50	173.00
3	700	2½	104.00	123.00	150.00	168.00	186.00
4	900	3	134.00	156.00	184.00	204.00	224.00
5	1,100	3½	147.00	169.50	200.00	221.50	243.00
6	1,500	4½	215.00	246.00	285.00	314.00	343.00
7	2,200	7	245.00	281.00	327.00	358.00	389.00

Prices on larger elevators, or on iron work alone, furnished on application.

Sprocket Wheels

as described in lists on following pages are made for all chains illustrated in this catalogue.

All MONOBAR WHEELS have removable malleable iron teeth.

Wheels for DODGE CHAINS are either plain or with removable sprockets.

The sprockets of wheels for Pin, Ley Bushed, Tubular, Giant, Howe, Transfer, Vulcan, Carrier and Block Chains are not removable.

Sprocket wheels will be fitted with friction or jaw clutches when so ordered, and will be charged for accordingly.

The following sprocket wheel lists cover standard patterns. An additional charge will be made for extra large hubs and other changes which increase weight.



Price List of Ewart Sprocket Wheels

Bored and Key-Seated
or Set-Screwed

No. 25			No. 32			Nos. 33 and 34			Nos. 35, 45, 55.		
Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price
1	4	\$0.75	1½	4	\$0.60	1¾	4	\$1.00	2½	5	\$1.25
1½	5	.85	2½	6	1.10	2¾	6	1.15	3	6	1.40
1¾	6	.95	2¾	7	1.20	3	7	1.20	3½	7	1.45
2	7	1.03	3	8	1.25	3½	8	1.35	4½	8	1.55
2½	8	1.10	3½	9	1.30	4	9	1.40	4¾	9	1.60
2¾	9	1.10	4	10	1.40	4½	10	1.45	5½	10	1.60
3	10	1.25	4½	11	1.40	5	11	1.50	5¾	11	1.65
3¼	11	1.25	5	12	1.40	5½	12	1.50	6½	12	1.70
3½	12	1.25	5½	13	1.40	6¼	13	1.60	6¾	13	1.70
3¾	13	1.30	6	14	1.40	6½	14	1.65	7½	14	1.85
4	14	1.30	6½	16	1.50	7¼	16	1.70	7¾	15	1.95
4½	15	1.32	7½	20	1.65	8	18	1.75	8½	16	1.95
4¾	16	1.32	8	22	1.75	8½	19	1.80	8¾	17	2.00
5	17	1.32	8½	24	1.80	9	20	1.85	9½	18	2.05
5¼	18	1.40	9½	26	1.95	9¾	22	1.95	9¾	19	2.10
5½	19	1.40	10	27	1.95	10¾	24	2.15	10¾	20	2.15
5¾	20	1.45	10¼	28	2.00	11¼	25	2.20	11	21	2.25
6	21	1.55	11¾	32	2.20	12	27	2.20	11¼	22	2.40
6¼	22	1.55	12	33	2.30	13	29	2.30	12	23	2.45
6½	23	1.60	12½	34	2.35	13½	30	2.75	12½	24	2.50
7	24	1.60	13¾	36	2.35	16	36	3.00	13	25	2.60
7¼	25	1.70	14	38	2.40	18¾	42	3.10	14	27	2.95
7½	26	1.70	14¾	40	2.60	24	54	5.00	14½	28	3.00
7¾	27	1.70	15	41	2.60	28½	64	5.50	15	29	3.05
8	28	1.70	16¼	44	2.70	42	94	11.60	15½	30	3.15
8¾	30	1.75	16½	45	2.70				16	31	3.20
9¼	34	1.90	17¾	48	3.15				16½	32	3.65
10	35	1.95	23	63	3.80				18	35	3.75
10¼	36	2.10							18½	36	4.05
10¾	37	2.15							20¼	39	4.20
11¼	40	2.15							20¾	40	4.60
12	42	2.15							21¾	42	4.80
12¼	43	2.15							22¾	44	5.25
12¾	44	2.15							23¼	45	5.40
13¾	48	2.20							23¾	46	5.50
14½	50	2.30							24¾	48	5.70
15	52	2.40							25¼	49	5.75
16	56	2.60							25¾	50	5.80
17¼	60	2.75							28	54	6.45
18	63	3.00							30	58	6.70
20	70	3.20							35¾	69	10.15

Ewart Sprocket Wheels—Continued

No. 42			No. 52			Nos. 57, 67, 77			No. 62		
Pitch Diam. Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price
3 $\frac{1}{2}$	7	\$1.45	2 $\frac{3}{4}$	6	\$1.40	4	5	\$1.50	3 $\frac{3}{4}$	7	\$1.55
3 $\frac{3}{4}$	8	1.50	3 $\frac{1}{4}$	7	1.45	4 $\frac{1}{2}$	6	1.70	4 $\frac{1}{4}$	8	1.60
4 $\frac{1}{4}$	9	1.55	3 $\frac{3}{4}$	8	1.55	5 $\frac{1}{4}$	7	1.80	4 $\frac{3}{4}$	9	1.75
4 $\frac{3}{4}$	11	1.55	4 $\frac{1}{4}$	9	1.60	6	8	2.05	5 $\frac{1}{4}$	10	1.80
5 $\frac{1}{4}$	12	1.60	4 $\frac{3}{4}$	10	1.65	6 $\frac{3}{4}$	9	2.20	5 $\frac{3}{4}$	11	1.85
5 $\frac{3}{4}$	13	1.65	5 $\frac{1}{4}$	12	1.70	7 $\frac{1}{4}$	10	2.45	6 $\frac{1}{4}$	12	1.90
6	14	1.70	6 $\frac{1}{4}$	13	1.75	8 $\frac{1}{4}$	11	2.50	6 $\frac{3}{4}$	13	1.95
7	16	1.75	6 $\frac{3}{4}$	14	1.85	9	12	2.90	7 $\frac{1}{4}$	14	2.00
7 $\frac{1}{2}$	17	1.85	7 $\frac{1}{4}$	15	1.90	9 $\frac{1}{2}$	13	2.95	8	15	2.05
8	18	1.95	8 $\frac{1}{4}$	17	2.10	10 $\frac{1}{4}$	14	3.05	8 $\frac{1}{2}$	16	2.20
8 $\frac{1}{4}$	19	2.00	9	19	2.20	11	15	3.20	9 $\frac{1}{2}$	18	2.65
8 $\frac{3}{4}$	20	2.10	9 $\frac{1}{2}$	20	2.30	11 $\frac{1}{4}$	16	3.25	10	19	2.70
9 $\frac{1}{4}$	21	2.15	10	21	2.40	12 $\frac{1}{4}$	17	3.55	10 $\frac{1}{2}$	20	2.75
9 $\frac{3}{4}$	22	2.25	11	23	2.65	12 $\frac{3}{4}$	18	3.60	11	21	2.85
10 $\frac{1}{2}$	24	2.30	12 $\frac{1}{2}$	26	2.80	13 $\frac{1}{4}$	19	4.15	11 $\frac{1}{2}$	22	3.15
11 $\frac{1}{4}$	26	2.40	13	27	2.85	14	20	4.20	12 $\frac{1}{4}$	23	3.20
11 $\frac{3}{4}$	27	2.50	14 $\frac{1}{4}$	30	3.40	14 $\frac{3}{4}$	21	4.25	12 $\frac{3}{4}$	24	3.25
12 $\frac{1}{4}$	28	2.70	14 $\frac{3}{4}$	31	3.50	15 $\frac{1}{4}$	22	4.35	13 $\frac{1}{4}$	26	3.50
14	32	3.00	15 $\frac{1}{4}$	32	3.70	16 $\frac{1}{4}$	23	4.65	14 $\frac{1}{4}$	28	3.60
15 $\frac{1}{4}$	36	3.30	15 $\frac{3}{4}$	33	3.80	17	24	5.05	15 $\frac{3}{4}$	30	4.10
17 $\frac{1}{4}$	41	3.80	16 $\frac{1}{4}$	34	4.00	17 $\frac{3}{4}$	25	5.25	18	34	4.60
20	46	4.55	16 $\frac{3}{4}$	35	4.10	19	26	5.65	20	38	5.30
No. 51			17 $\frac{1}{2}$	37	4.30	19 $\frac{1}{4}$	27	5.90	21	39	5.80
			19 $\frac{1}{4}$	40	4.50	20 $\frac{1}{4}$	28	6.10	21 $\frac{1}{2}$	41	5.90
			20 $\frac{1}{4}$	42	4.80	22	30	6.55	22 $\frac{1}{4}$	42	6.00
			23 $\frac{1}{2}$	49	5.00	23 $\frac{1}{4}$	32	6.75	23 $\frac{1}{4}$	45	6.40
			25	52	5.25	24 $\frac{1}{4}$	33	7.10	25 $\frac{1}{4}$	48	6.55
			26	54	5.45	25	34	7.20	25 $\frac{3}{4}$	49	7.30
			30 $\frac{3}{4}$	64	8.50	25 $\frac{3}{4}$	35	7.30	30 $\frac{1}{2}$	58	8.65
						26 $\frac{1}{4}$	36	7.80	No. 66		
						28	38	8.15			
						29 $\frac{1}{4}$	40	9.90			
						30	41	10.00			
						31 $\frac{1}{4}$	43	11.25			
						32 $\frac{1}{4}$	44	11.50			
						35 $\frac{1}{4}$	48	12.20			
						36	49	13.40			
						38 $\frac{1}{4}$	52	14.30			
						43	59	18.20			
2 $\frac{1}{2}$	6	\$1.20				43 $\frac{1}{4}$	60	18.50	9	14	\$2.65
2 $\frac{3}{4}$	7	1.25				47	64	20.50	11 $\frac{1}{2}$	18	3.00
3	8	1.40				54	74	25.00	12	19	3.10
3 $\frac{1}{4}$	9	1.45									
4	11	1.55									
4 $\frac{1}{4}$	12	1.60									
4 $\frac{3}{4}$	13	1.65									
5	14	1.70									
5 $\frac{1}{4}$	15	1.80									
5 $\frac{3}{4}$	16	1.80									
6 $\frac{1}{4}$	17	1.80									
6 $\frac{3}{4}$	18	1.85									
7	19	1.85									
7 $\frac{1}{4}$	20	1.90									
7 $\frac{3}{4}$	21	1.95									
8	22	2.00									
9	24	2.10									
9 $\frac{1}{4}$	25	2.15									
9 $\frac{3}{4}$	26	2.20									
10	27	2.30									
10 $\frac{1}{4}$	28	2.40									
11	30	2.70									
11 $\frac{1}{4}$	31	2.95									
12 $\frac{1}{4}$	33	3.00									
13 $\frac{1}{4}$	36	3.10									
15 $\frac{1}{2}$	42	3.15									
16 $\frac{1}{4}$	44	3.20									
18 $\frac{1}{4}$	50	3.95									

Ewart Sprocket Wheels—Continued

Nos. 75, 78, 88			Nos. 83 and 93			No. 103		
Pitch Diam. Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price
4¼	5	\$1.95	12	18	\$4.60	7	7	\$2.90
5	6	2.10	16	26	5.65	8	8	3.75
5½	7	2.20	20	32		9	9	3.95
6¾	8	2.30	24	38	9.15	9½	10	4.05
7½	9	2.60	25½	40	9.65	10¼	11	4.35
8½	10	2.85	28½	44		11¼	12	5.00
9¾	11	2.90	30	48		12¼	13	5.50
10	12	3.45	34	54		13¼	14	5.75
10½	13	3.60	41	64		14¼	15	6.05
11¼	14	3.75	<div>Nos. 85 and 95</div>			15¼	16	6.30
12½	15	4.25				16¼	17	6.60
13¼	16	4.95				17½	18	7.00
14¼	17	5.25				18½	19	7.65
15	18	5.30				19½	20	7.90
15½	19	5.40				21½	22	8.50
16¼	20	5.90				23½	24	9.75
17½	21	6.10	7¾	6	\$2.95	25½	26	10.40
18¼	22	6.30	11¼	9	4.70	26½	27	10.65
19¼	23	6.80	12¼	10	5.00	27½	28	10.85
20	24	7.15	14	11	5.80	29¼	30	11.35
20½	25	7.75	15¼	12	7.60	30¼	31	15.60
21¼	26	7.90	16½	13	7.70	31¼	32	16.60
22½	27	8.50	17¼	14	7.80	32½	33	18.75
23¼	28	9.00	20¼	16	8.80	33¼	34	19.00
24¼	29	9.25	24	19	9.75	35¼	36	19.25
25	30	9.30	25¼	20	10.20	37¼	38	20.85
26¼	32	9.90	27¼	22	11.70	39¼	40	21.25
27½	33	10.15	30¼	24	13.75	41	42	22.00
28¼	34	10.70	31¼	25	15.20	45	46	24.80
29¼	35	11.35	35½	28	20.25	47¾	49	28.60
30	36	11.50	48¼	38	29.50	58¼	60	40.00
31	37	11.75				64¼	66	45.00
33¼	40	13.20						
36¼	44	13.85						
38½	46	20.45						
41	49	21.25						
41¼	50	21.50						
48½	58	24.70						
50	60	25.10						
54	65	30.75						
64	77	41.00						

Ewart Sprocket Wheels—*Continued*

Nos. 108 and 110			No. 114			No. 122			No. 124		
Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam Ins.	No. of Teeth	Price	Pitch Diam. Ins.	No. of Teeth	Price
12¼	8	\$5.90	8½	8	\$4.20	16	8	\$8.35	10½	8	\$4.55
13¼	9	6.00	10½	10	4.60	17¼	9	9.65	11¾	9	4.95
16¼	11	8.00	12¾	12	5.15	19¾	10	10.35	13	10	6.50
18¾	12	8.85	13¾	13	5.90	21½	11	12.30	14½	11	7.00
19¾	13	9.00	14¾	14	6.45	23½	12	13.95	15¾	12	8.00
24¼	16	12.50	16¾	16	7.55	27½	14	18.65	17	13	8.60
27¼	18	14.75	17¾	17	8.00	31½	16	22.95	18½	14	9.25
30¼	20	16.75	20	19	9.25	37	19	24.10	19½	15	10.30
36	24	19.45	22	21	10.85	40¾	21	28.00	20¾	16	11.45
45	30	29.35	25	24	12.10				22	17	13.70
			31¼	30	16.60	No. 160			24½	19	14.40
			37½	36	21.95				26	20	14.75
			47½	46	26.25				28½	22	15.40
									29¾	23	21.65
						30	9	\$37.00	31	24	22.25
						40	12	46.50	32½	25	23.00
						43	13	55.50	36¼	28	26.00
									41½	32	33.30
									44	34	35.00
									49½	38	45.90
									72½	56	79.50
									85½	66	111.25

Additional Price to be added to the List Price for Split Sprocket Wheels

Diameter	No. of Link-Belt	Price	Diameter	No. of Link-Belt	Price
6 to 12	25 to 52	\$1.70	24¼ to 36	32 to 52	\$2.90
	57 to 77	1.85		57 to 77	3.20
	78 to 95	2.00		78 to 95	3.60
	103 to 160	2.20		103 to 160	4.00
12¼ to 24	25 to 52	\$2.35	36¼ to 60	57 to 77	\$4.60
	57 to 77	2.50		78 to 95	6.00
	78 to 95	2.65		103 to 160	7.80
	103 to 160	2.80			
			Above 60	78 to 160	\$12.00



NOTE DEPTH OF CHILL PRODUCED BY THE NEW HARDENING PROCESS

We are now able to offer for severe duty

Case-Hardened Sprocket Wheels

treated by a NEW PROCESS which makes the teeth and rims so hard as to be PRACTICALLY INDESTRUCTIBLE and gives them a SMOOTH, UNIFORM and CLOSE-GRAINED SURFACE, which the links can engage without cutting.

It is worry, not work, that kills, and worry results from misfit between a man and his affairs. Read wear for worry and the same is true in mechanics. For an illustration—The Drive Chain and its wheel. So long as their fit to each other is maintained they do not wear and you need not worry. When either begins to work against, instead of with the other, misfit has arrived and wear carries both toward the scrap heap.

In practically all chain drives the number of links in the chain exceeds the number of teeth in both wheels. Each

wheel tooth, therefore, comes into service oftener than each chain link, and the longer the chain, the greater the disproportion.

To postpone the misfit which causes rapid wear, the correct pitch of the wheel teeth must be preserved. Theory and practice agree on this conclusion, and an exhaustive series of tests carried on for a period of two years has established the facts that—

- (1) Until the wheel teeth begin to wear, the wear on the chain is inappreciable.
- (2) Slight wear of the wheel teeth is followed by increasingly rapid cutting of both wheel and chain.

Where chains are employed to handle gritty material, or run in an atmosphere of abrasive dust, it is of great importance that the teeth of the sprocket wheels be hard enough to resist wear and maintain correct pitch.

Case-Hardened Wheels are of advantage in all Link-Belt gearing, but are particularly recommended for use in Cement Mills, Phosphate Plants, Stone Crushing Plants, and for all work where grit is present.

We are prepared to furnish Case-Hardened Wheels for Nos. 88, 103, 114 and 124 Ewart Link-Belt at prices given in the following list, which will be extended to cover other numbers as required.

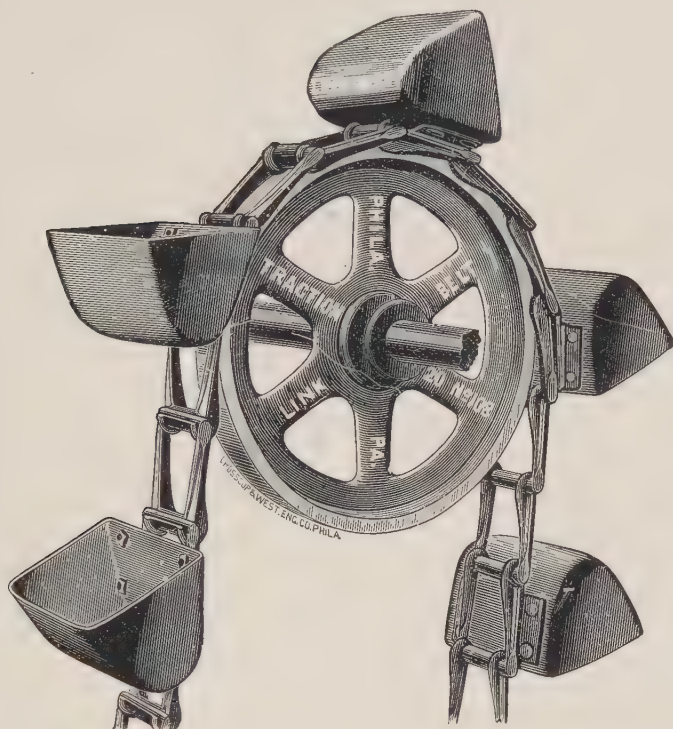
Net Price List

Ewart Case-Hardened Sprocket Wheels

No. 88				No. 103			
Pitch Diam. Ins.	No. of Teeth	Price Solid	Price Split	Pitch Diam. Ins.	No. of Teeth	Price Solid	Price Split
6¾	8	\$3.25	\$4.50	8	8	\$5.75	\$7.50
8¼	10	4.20	5.45	9¾	10	6.25	8.30
9¼	11	4.40	5.70	11¾	12	6.45	8.60
10	12	4.90	6.15	12¾	13	6.60	8.90
10¾	13	5.15	6.50	13¾	14	7.20	9.75
11¾	14	5.65	7.20	14¾	15	7.80	10.50
12½	15	5.90	7.75	15¾	16	8.40	11.50
13¼	16	6.30	8.00	16¾	17	9.60	13.35
14¼	17	6.60	8.20	17½	18	10.80	14.50
15	18	7.10	8.70	18½	19	12.05	15.15
15¾	19	7.20	8.80	19½	20	13.20	15.75
16¾	20	7.80	9.40	21½	22	14.40	17.00
18¼	22	8.20	9.80	22½	23	15.10	17.60
19¼	23	8.60	10.35	23½	24	16.25	18.20
20	24	9.05	10.75	25½	26	17.55	19.95
21¾	26	10.00	11.90	27½	28	18.65	21.05
23¼	28	10.85	13.15	29½	30	19.85	22.25
25	30	12.00	15.15	30½	31	20.60	23.00
26¾	32	14.40	17.00	31½	32	21.25	23.65
28¼	34	16.20	19.35	33¼	34	22.90	25.30
30	36	17.70	21.15	35¼	36	24.15	26.85
36¾	44	20.15	25.35	38¼	39	35.85	40.55
				47¾	49	21.50 44.50	20.50 49.50
				No. 114			
				31¼	30	20.00	23.00
				36½	35	26.00	31.00
				No. 124			
				26	20	\$17.50	\$20.00
				44	34	\$42.00	\$47.00

Owing to the treatment these wheels receive, shipments cannot be guaranteed in less than two weeks from receipt of order.

Ewart Traction Wheels

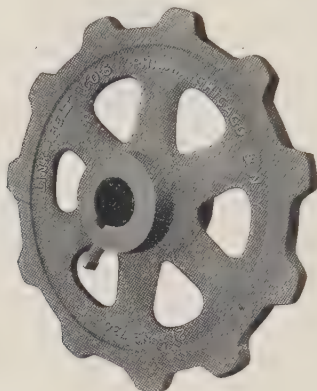


Traction Wheels have turned rims and are very satisfactory for use in elevators, handling heavy or gritty material, the grip being ample to do all the work that the Link-Belting and Buckets should be called upon to do ; and at the same time, in the event of a serious obstruction, the chain may slip. Elevators provided with these wheels will run smoother and last longer in gritty material than they would if sprocket wheels were used.

PRICE LIST

No. 85		Nos. 108, 110		No. 122	
Pitch Diam. Ins.	Price	Pitch Diam. Ins.	Price	Pitch Diam. Ins.	Price
12	\$6.10	16½	\$9.15	12	\$9.00
14	7.00	17¼	10.10	16	10.00
15	7.55	18	10.75	18	12.30
16	8.60	20	11.65	20	13.40
18	8.90	22	13.30	22	14.60
20	10.80	24	13.85	24	16.10
25	14.25	28	16.50	25¾	16.80
28	17.10	30	19.55	26	17.55
30	19.55	36	25.00	30	20.00
36	24.30			31	23.55
				37	26.35
				42	31.10

Sprocket Wheels for Pin Chains ("700 Class")



PRICE LIST

No. 710 Sprocket Wheels

Diameter	No. of Teeth	Price
12 $\frac{1}{4}$	8	\$5.90
13 $\frac{3}{4}$	9	6.00
16	11	8.00
18 $\frac{1}{4}$	12	8.85
19 $\frac{3}{4}$	13	9.00
24 $\frac{1}{4}$	16	12.50
27 $\frac{1}{4}$	18	15.50
30 $\frac{1}{4}$	20	16.75
36	24	19.45

No. 745 Sprocket Wheels

Diameter	No. of Teeth	Price
29 $\frac{1}{2}$	10	\$24.00
32	11	27.75
37 $\frac{1}{2}$	13	41.20

No. 720 Sprocket Wheels

12	6	\$3.15
15 $\frac{1}{2}$	8	5.75
19 $\frac{1}{2}$	10	8.95
23	12	10.15
27	14	13.95
28 $\frac{1}{2}$	15	14.85
32	17	20.00
40	21	28.00

No. 755 Sprocket Wheels

31 $\frac{1}{2}$	8	\$29.85
35 $\frac{1}{4}$	9	31.65
39	10	49.00
43	11	54.00

No. 730 Sprocket Wheels

16	8	\$7.30
17 $\frac{1}{2}$	9	8.90
21 $\frac{1}{4}$	11	11.40
25	13	13.40
27	14	15.85
30	15	17.70
40 $\frac{1}{4}$	21	25.00

No. 744 Sprocket Wheels

17 $\frac{1}{2}$	9	\$9.00
19 $\frac{1}{2}$	10	10.20
21 $\frac{1}{4}$	11	14.25
23 $\frac{1}{4}$	12	15.00
25	13	16.00
29	15	20.00
36 $\frac{1}{2}$	19	31.00
46	24	46.50

No. 926 Sprocket Wheels

10 $\frac{1}{2}$	8	\$4.55
11 $\frac{3}{4}$	9	4.95
13	10	6.50
14 $\frac{1}{2}$	11	7.00
15 $\frac{1}{4}$	12	8.00
17	13	8.60
18	14	9.25
19 $\frac{1}{2}$	15	10.30
20 $\frac{1}{4}$	16	11.45
22	17	13.70
24	19	14.40
26	20	14.75
28 $\frac{1}{2}$	22	15.40
29 $\frac{3}{4}$	23	21.65
31	24	22.25
32 $\frac{1}{2}$	25	23.00
36	28	26.00
41 $\frac{1}{4}$	32	33.30
44	34	35.00
49 $\frac{1}{4}$	38	45.90
72 $\frac{1}{2}$	56	79.50
85 $\frac{1}{4}$	33 D	111.25



Case Hardened Sprocket Wheels for Ley Steel Bushed Chains

PRICE LIST

No. 823 Sprocket Wheels			No. 844 Sprocket Wheels		
Pitch Diameter	No. of Teeth	Price	Pitch Diameter	No. of Teeth	Price
10 $\frac{1}{3}$	8	\$5.55	18	9	\$14.75
15 $\frac{1}{2}$	12	8.25	19 $\frac{1}{2}$	10	18.60
18	14	9.60	23 $\frac{1}{4}$	12	21.25
19 $\frac{1}{4}$	15	12.00	25	13	24.75
20 $\frac{1}{2}$	16	12.50	29	15	35.25
24 $\frac{1}{2}$	19	13.95	32 $\frac{1}{4}$	17	47.10
30 $\frac{5}{8}$	24	19.05	36 $\frac{1}{2}$	19	50.70
No. 825 Sprocket Wheels			No. 845 Sprocket Wheels		
15 $\frac{1}{2}$	12	\$8.85	29 $\frac{1}{2}$	10	\$35.15
19 $\frac{1}{2}$	15	12.00	37 $\frac{1}{2}$	13	51.75
23	18	15.25			
30	23	24.35			
38 $\frac{1}{2}$	30	53.40			
No. 825 Traction Wheels			No. 847 Sprocket Wheels		
15	.....	\$7.20	23 $\frac{1}{4}$	12	\$31.20
15 $\frac{3}{4}$	.....	8.25	29 $\frac{1}{2}$	15	39.15
18	.....	9.35	37	19	64.70
20	.....	10.80			
30	.....	20.40			
No. 835 Sprocket Wheels			No. 855 Sprocket Wheels		
23 $\frac{1}{8}$	18	\$28.90	35 $\frac{1}{4}$	9	\$53.00
19 $\frac{1}{4}$	15	22.00	39	10	66.80
29 $\frac{3}{8}$	23	35.85	43	11	72.80
No. 855 Traction Wheels					
			22	.....	\$22.80
			35 $\frac{1}{4}$	.....	42.15
			36	.....	44.25

We have a number of special patterns not included in above lists and are adding others as required.

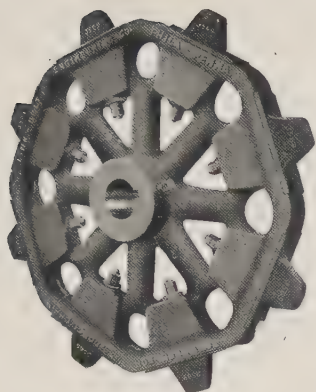
Sprocket Wheels for Roller Chains
("1100" Class)



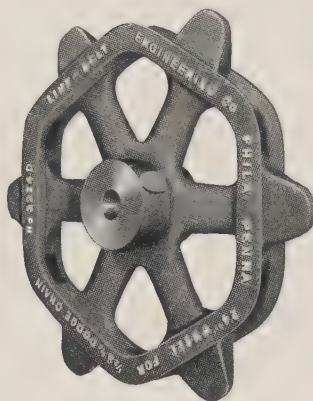
PRICE LIST

No. 1112 Sprocket Wheels			No. 1113 Sprocket Wheels		
Pitch Diameter	No. of Teeth	Price	Pitch Diameter	No. of Teeth	Price
7½	6	\$2.10	15½	12	\$7.20
9½	8	3.10	18	14	9.30
10¾	9	3.75	25 ³ / ₁₆	20	14.55
12	10 (DriveR)	4.20	32	25	20.85
12	10 (DriveN)		36	28	24.45
14¾	12	5.50	57¾	45	48.60
20¾	17 (DriveR)	8.25	No. 1130 Sprocket Wheels		
20 ¹ / ₁₆	17 (DriveN)		16	8	\$9.75
21¾	18	8.80	17¾	9	10.65
25	21 (DriveR)	10.40	23¾	12	13.30
24¾	21 (DriveN)		27¾	14	14.55
26	22	10.95	29	15	17.20
28¾	24	12.00	31	16	22.50
33	28	13.95	40¾	21	36.00
42¾	36	18.80	No. 1131 Sprocket Wheel		
			38½	20	\$34.50
			No. 1170 Sprocket Wheel		
			41½	7	\$47.50

Dodge Chain Wheels



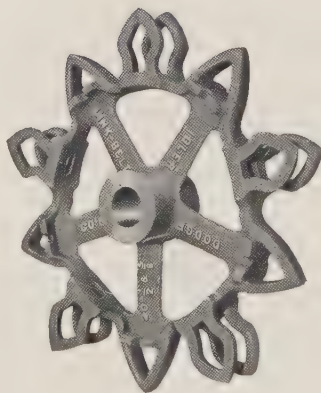
REMOVABLE TOOTH
SPROCKET WHEEL



PLAIN WHEEL



TRACTION WHEEL



SPROCKET IDLER

Dodge Wheels are of four varieties: REMOVABLE TOOTH SPROCKET WHEELS are cast with recessed rims in which steel wearing plates are fitted and gray iron teeth are inserted. Wheels of this class which have been in service ten years are still in good condition. When the gray iron teeth are finally worn out they are replaced quickly and cheaply. PLAIN SPROCKET WHEELS are not chilled, and the teeth are not removable. TRACTION WHEELS have grooved rims fitting the chain. These wheels can be run horizontally or vertically. SPROCKET IDLERS, for supporting and guiding the return chain of conveyors.

Sprocket Wheels for Dodge Chain

(See cuts on page 273)

PRICE LISTS

Plain Sprocket Wheels				Traction Wheels			
Size Chain Ins.	Diameter	No. of Teeth	Price	Size Chain Ins.	Diameter	Flange	Price
$\frac{1}{2}$ and $\frac{5}{8}$	24	6	\$13.30	$\frac{1}{2}$ and $\frac{5}{8}$	8	wide	\$3.35
$\frac{1}{2}$ and $\frac{5}{8}$	30	8	19.25	$\frac{1}{2}$ and $\frac{5}{8}$	14 $\frac{1}{2}$	wide	5.30
$\frac{1}{2}$ and $\frac{5}{8}$	38	10	28.10	$\frac{1}{2}$ and $\frac{5}{8}$	20	narrow	5.55
				$\frac{1}{2}$ and $\frac{5}{8}$	20	wide	7.40
				$\frac{1}{2}$ and $\frac{5}{8}$	24	narrow	8.10
				$\frac{1}{2}$ and $\frac{5}{8}$	24	wide	9.00
				$\frac{1}{2}$ and $\frac{5}{8}$	30	narrow	13.55
				$\frac{1}{2}$ and $\frac{5}{8}$	30	wide	17.55
				$\frac{1}{2}$ and $\frac{5}{8}$	42	narrow	29.00
				$\frac{3}{4}$	12	wide	8.90
				$\frac{3}{4}$	20	wide	12.45
				$\frac{3}{4}$	24	narrow	26.05
				$\frac{3}{4}$	30	narrow	17.15
				$\frac{3}{4}$	30	wide	18.20
				$\frac{3}{4}$	30	ex. heavy	44.20
				$\frac{3}{4}$	36 $\frac{3}{4}$	narrow	31.25
				$\frac{3}{4}$	36 $\frac{3}{4}$	wide	38.25
				$\frac{3}{4}$	36 $\frac{3}{4}$	ex. heavy	72.55
				$\frac{3}{4}$	40	narrow	37.40
				$\frac{3}{4}$	40	wide	45.00
				$\frac{3}{4}$	48 $\frac{1}{2}$	narrow	57.80
				$\frac{7}{8}$	36 $\frac{3}{4}$	narrow	31.65
				$\frac{7}{8}$	39 $\frac{1}{2}$	. . .	27.00
				$\frac{7}{8}$	46 $\frac{1}{4}$	narrow	44.20
Removable Tooth Wheels							
$\frac{1}{2}$ and $\frac{5}{8}$	24	6	\$29.90				
$\frac{1}{2}$ and $\frac{5}{8}$	30	8	36.45				
$\frac{1}{2}$ and $\frac{5}{8}$	42 $\frac{1}{4}$	11	62.10				
$\frac{1}{2}$ and $\frac{5}{8}$	46 $\frac{1}{2}$	12	67.85				
$\frac{3}{4}$	30	6	44.45				
$\frac{3}{4}$	37	7	55.65				
$\frac{3}{4}$	42 $\frac{1}{4}$	8	63.50				
$\frac{3}{4}$	52 $\frac{3}{4}$	10	101.50				
$\frac{7}{8}$	42	8	94.25				
$\frac{7}{8}$	46 $\frac{1}{2}$	6	92.43				

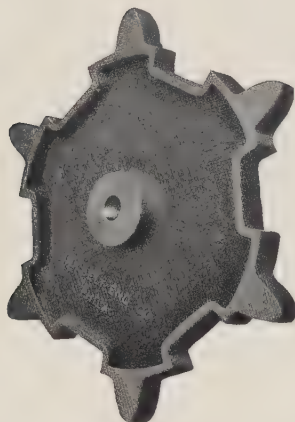
PRICE LIST OF SPROCKET IDLERS

Chain, $\frac{1}{2}$ and $\frac{5}{8}$ inch; diameter, 20 inches; price, \$5.75
Chain, $\frac{3}{4}$ inch; diameter, 24 inches; price, 11.00

EXTRA TEETH WITH BOLTS

$\frac{1}{2}$ inch, 65c. $\frac{5}{8}$ inch, 65c. $\frac{3}{4}$ inch, \$1.10 $\frac{7}{8}$ inch, \$2.35

Wheels for Howe Chain



- No. 1 or No. 2, 24 inches diameter, 12 teeth, \$16.00
 No. 3 20 inches diameter, flanged, 24.00
 No. 4 Idler, 24 inches diameter, 6 teeth, 10.00

Diagram on page 279 shows the positions of these wheels in log hauls.

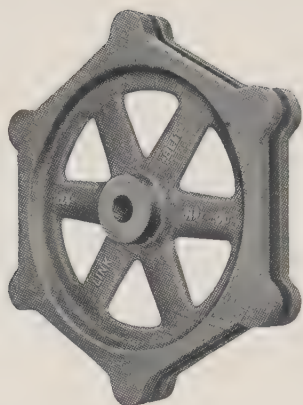
NOTE.—We make an Iron Frame Log Jack for driving haul-ups, for an account of which refer to page 279.

Nos. 1250 and 1350 Tubular Chain Wheels

Diameter	Number of Teeth	Price
23 ¹ / ₄	6	\$16.00
30	8	25.00
38	10	34.00

Nos. 1250 and 1350 Traction Wheels

26	. . .	\$15.40
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GIANT CHAIN WHEEL

No. 600 Giant Chain Wheels

Diameter	No. of Teeth	Price
9¾	5	\$5.60
12	6 S, 6 D	8.00
17½	9	9.35
19¾	10	11.90
23¼	12	11.85
23¾	12 D	16.60
31	16 D	29.30
42½	22	31.60

No. 1075

16¾	5	\$14.10
26 ⅜	8	24.80

No. 1200

24	6	\$16.85
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No. 1200 with No. 600 Coupler

23	8	\$19.85
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No. 1260 Cane Conductor Chain
Wheels

16½	8	\$7.50
18½	9	9.30
24	12	13.80
36¼	18	22.20



No. 500 STEEPLE TOP CHAIN WHEEL

No. 500 Steeple Top Chain Wheels

Diameter	No. of Teeth	Price
8	12	\$3.50
11½	18	4.15
12¾	20	4.70
15¼	24	5.40

No. 550 Sprocket Wheels

17	9	\$12.30
21½	11	13.50
42½	22	57.00

No. 575 Block Chain Wheels

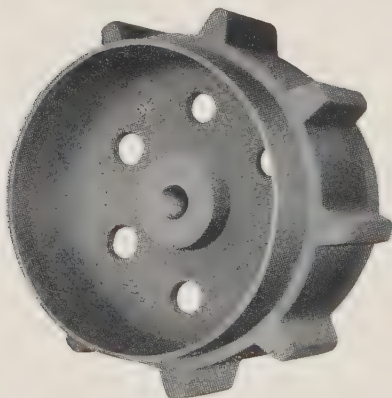
10	8	\$5.70
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No. 580 Block Chain Wheels

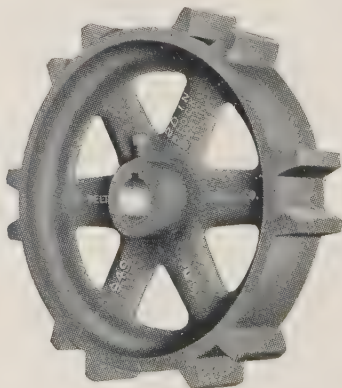
20	6	\$14.00
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No. 585 Reinforced Block Chain
Wheels

20	6	\$12.00
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No. 550 SPROCKET WHEEL



BLOCK CHAIN WHEEL

Seven-Tooth Monobar Sprocket Wheels

With Malleable Iron Teeth



PRICE LIST

Diameter Inches	No.	Price
27	612	\$29.00
41	618	54.50
41	818	61.00
58 1/4 (10-tooth Idler only)	818	54.00
41	1018	67.00
56	824	106.00
56	1024	113.00
56	1224	115.00
56	1224 ex. heavy	191.00
56	1424	130.50
56	1424 ex. heavy	205.00
83	1636	390.00

Extra Malleable Iron Teeth with Bolts

No.	612	618	818	824	1018	1024	1224	1424	1636
Price each .	\$1.55	\$2.40	\$2.75	\$3.60	\$3.35	\$4.40	\$4.50	\$10.65	\$19.50

Price List of
Equalizing Gears and Elliptical Pinions for
Seven-Tooth Sprocket Wheels

No.	Diameter Inches	No. Teeth	Pitch Inches	Face Inches	Price	Note
3851	42	84	1½	4½	\$29.25	Gear
3852	6	12	1½	4¾	4.25	Pinion
5900	56	84	2 ¹ / ₁₀	6	59.00	Gear
5901	8	12	2 ¹ / ₁₀	6	9.50	Pinion
3917	74.92	84	2 ⁸ / ₁₀	8	155.00	Gear
3918	10.8	12	2 ⁸ / ₁₀	8	17.50	Pinion
4485	64	84	2 ⁴ / ₁₀	7	99.00	Gear
4486	9.14	12	2 ⁴ / ₁₀	7¾	12.50	Pinion

For Five or Ten-Tooth Sprocket Wheels

4315	63.75	80	2½	7	\$96.00	Gear
4316	12.75	16	2½	7¾	20.00	Pinion

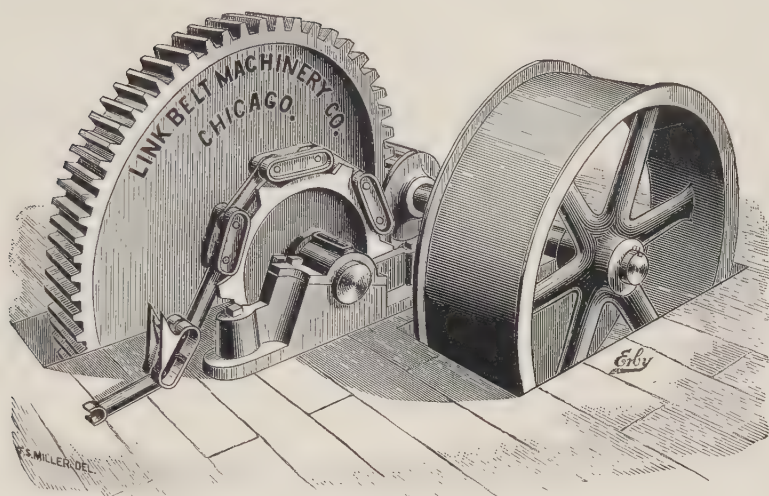
Price List of Sole Plates for Pillow Blocks,
Complete with Bolts

To maintain permanent alignment of Gear and Pinion Shafts

For dimensions see page 315

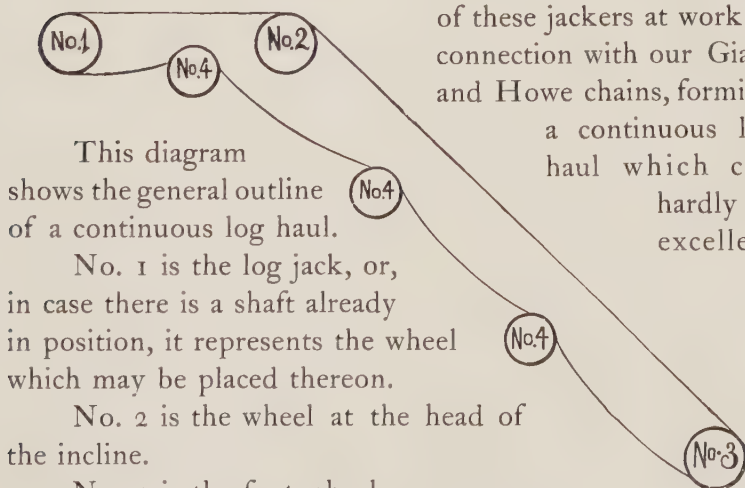
No.	Sizes of Pillow Blocks Inches	Diameters of Gears Inches	Price per Pair
4233	2 ¹ / ₈ and 2 ³ / ₁₆	42 and 6	\$14.25
4148	3 ⁷ / ₁₆ and 2 ⁷ / ₁₆	42 and 6	17.00
4141	3 ⁷ / ₁₆ and 2 ¹ / ₈	42 and 6	21.00
4026	2 ¹ / ₈ and 2 ⁷ / ₁₆	56 and 8	28.00
4260	3 ⁷ / ₁₆ and 2 ⁷ / ₁₆	56 and 8	29.00
3905	4 ⁷ / ₁₆ and 2 ¹ / ₈	56 and 8	38.00
5005	4 ⁷ / ₁₆ and 3 ⁷ / ₁₆	56 and 8	24.50
4261	5 ¹ / ₈ and 3 ⁷ / ₁₆	56 and 8	30.50
4425	3 ¹ / ₈ and 2 ¹ / ₈	64 and 9	17.00
4321	4 ¹ / ₈ and 3 ⁷ / ₁₆	64 and 9	30.50
5507	4 ¹ / ₈ and 3 ¹ / ₈	64 and 9	32.00
4096	4 ⁷ / ₁₆ and 3 ¹ / ₈	75 and 11	56.50
3919	5 ⁷ / ₁₆ and 3 ⁷ / ₁₆	75 and 11	64.00
4261	5 ¹ / ₈ and 3 ⁷ / ₁₆	75 and 11	69.00
4010	5 ¹ / ₈ and 3 ¹ / ₈	75 and 11	74.00

Iron Frame Log Jack



Our Iron Frame Log Jack, as shown in above cut, has a strong, heavy frame, well proportioned for the work to be done. The driving pinion is housed, the pulley double flanged, and the gear wheel has a solid plate center.

We have a large number of these jackers at work in connection with our Giant and Howe chains, forming a continuous log haul which can hardly be excelled.



This diagram shows the general outline of a continuous log haul.

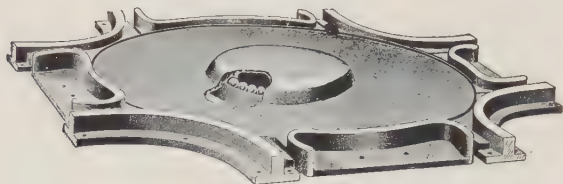
No. 1 is the log jack, or, in case there is a shaft already in position, it represents the wheel which may be placed thereon.

No. 2 is the wheel at the head of the incline.

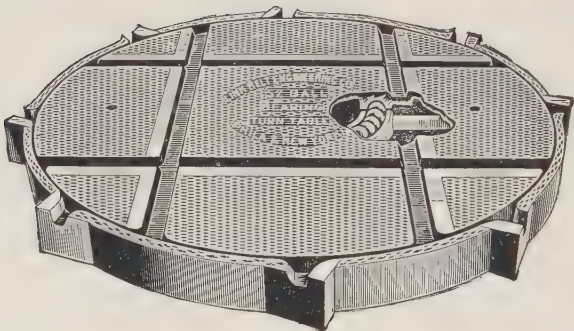
No. 3 is the foot wheel.

No. 4 the idlers for the returning chain.

The Link-Belt Ball-Bearing Turn-Tables



STYLE A



STYLE B

PRICE LIST

Diameter Inches	Style	Track Gauge Inches	Price	Limit of Load
43	A	22 1/4	\$50.00	2 Tons
48	A	24, 24 5/8, 25, 26 1/4	55.00	2 Tons
52	B	24	70.00	3 Tons
60	A	26, 30	85.00	2 Tons
60	B	21, 30	85.00	3 Tons
84	A	48	150.00	2 Tons
96	A	49	165.00	2 Tons
120	A	30 or more	300.00	2 Tons

Elevator and Conveyor Bolts

These bolts are of superior quality, and made expressly for the attachments and uses stated.



Slot Head Bolts

$\frac{1}{8} \times \frac{1}{2}$	\$0.80 per 100
For all attachments of Nos. 32, 33, 34 and for No. 35 A ¹ A ² K ¹ , No. 42 K ³ K ⁶ , No. 45 A ³ G ¹ K ¹ K ³ , No. 52 G ¹ , No. 55 A ¹ A ² K ¹ .	
$\frac{1}{4} \times \frac{5}{8}$	\$1.00 per 100
For No. 35 A ¹ C ¹ , No. 42 A ¹ K ¹ C ⁵ , No. 45 A ¹ C ¹ , No. 52 A ¹ , No. 55 C ¹ , No. 57 A ¹ , No. 62 A ¹ , No. 67 A ¹	



Excelsior Bolts

$\frac{1}{4} \times \frac{3}{4}$	\$1.70 per 100
For No. 57 K ¹ , No. 62 K ¹ , No. 67 K ¹ , No. 75 K ¹ , No. 77 K ¹ , No. 78 K ¹ , No. 85 K ¹ .	
$\frac{5}{16} \times \frac{3}{4}$	\$2.00 per 100
For No. 78 K ⁴ , No. 85 K ² , No. 88 A ³ K ¹ , No. 95 K ² , No. 106 K ² K ⁴ .	
$\frac{3}{8} \times \frac{3}{4}$	\$2.50 per 100
For No. 85 K ⁷ , No. 103 A ² A ⁵ K ¹ , No. 105 K ² , No. 108 K ² K ³ , No. 110 K ² , No. 122 K ² .	
$\frac{1}{2} \times 1 \frac{1}{4}$	\$4.00 per 100
For No. 160 K ² .	



Square Head Bolts

$\frac{1}{4} \times \frac{1}{4}$	\$1.70 per 100
For No. 57 F ² , No. 67 F ² , No. 77 G ¹ , No. 78 A ¹ G ¹ , No. 88 G ⁶ , No. 103 G ⁶ .	
$\frac{5}{16} \times 1$	\$2.00 per 100
For No. 78 F ² and No. 88 F ² .	
$\frac{3}{8} \times 1$	\$2.40 per 100
For No. 83 G ¹ , No. 85 F ² , No. 95 F ² , No. 108 F ² G ¹ , No. 110 F ² , No. 122 F ² , and for $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ -inch F. & K. Dodge chain attachments.	



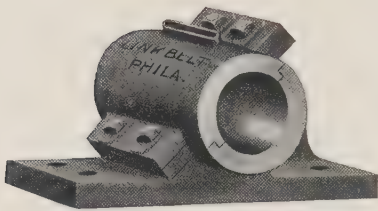
Acme Bolts

For use with leather, cotton or rubber belting.

$\frac{1}{4} \times \frac{3}{4}$	\$2.00 per 100	$\frac{1}{4} \times 1$	\$2.50 per 100
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Rigid Journal Bearings (Babbitted)

For Heavy Work



PILLOW BLOCK OR POST BOX



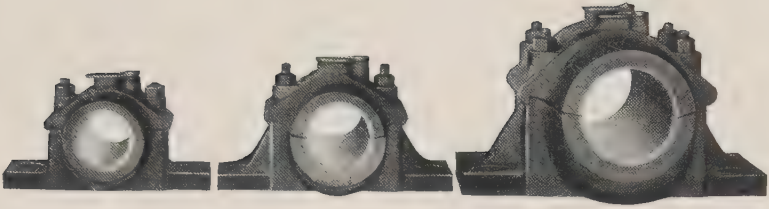
SOLID BOX

PRICE LIST

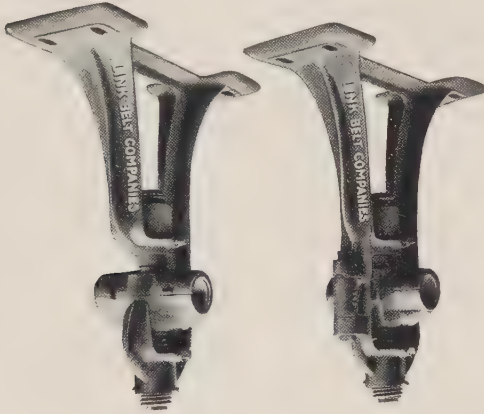
Size	Price		Size	Price	
	Pillow Block or Post Box	Solid Box		Pillow Block or Post Box	Solid Box
$1\frac{5}{16}$	. . . .	\$0.85	$3\frac{7}{8}$	\$12.00	\$8.00
$1\frac{3}{8}$	. . . .	1.00	$3\frac{1}{2}$	16.50	11.00
$1\frac{7}{8}$	. . . .	1.35	$4\frac{7}{8}$	22.00	27.00
$1\frac{1}{2}$	. . . .	1.75	$4\frac{1}{2}$	30.00	30.00
$1\frac{5}{8}$	\$4.00	2.20	$5\frac{1}{8}$	62.00	. . . .
$2\frac{3}{8}$	4.75	2.90	$6\frac{1}{8}$	185.00	. . . .
$2\frac{7}{8}$	6.00	3.60	8	140.00	{ Pillow Block only
$2\frac{1}{2}$	7.00	4.40	12	480.00	
$2\frac{5}{8}$	8.50	5.50			. . . .

In addition to the above we have a large assortment of Special Journal Bearings, designed for vertical and horizontal shafts.

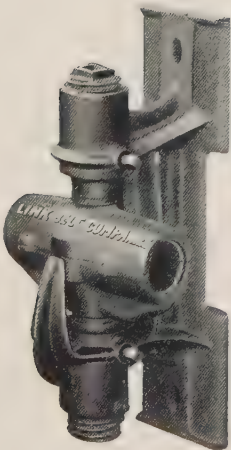
For detailed dimensions see pages 311 and 312.



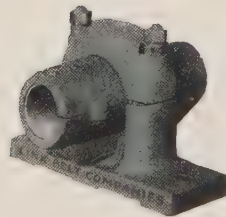
CHAIN-OILING RIGID PILLOW BLOCKS



OPEN HANGER DOUBLE BRACED HANGER



POST HANGER



BALL AND SOCKET CHAIN-OILING PILLOW BLOCK

For detailed drawings and dimensions see page 310.

Pulleys, Hangers (Drop, Floor or Post) and Shaft Bearings

Other than shown in this catalogue

No one line of patterns covers the field of engineering work, and no one set of lists is of general use among manufacturers.

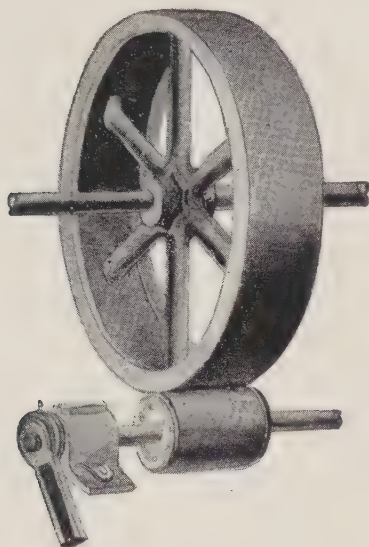
While we have a complete line of plain, wick-oiling and chain-oiling bearings, it is our practice to use in this line of power transmission machinery the standard designs that best conform to the demands of the work to be done.

Favorable arrangements with the most extensive makers enable us to supply any of the leading lines at the lowest market rates.

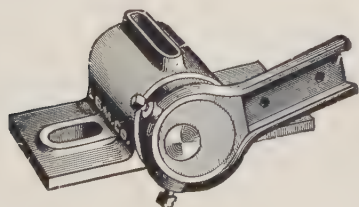
For elevator and conveyor head shafts we recommend the Rigid Link-Belt Bearings, which are built very much heavier than standard makes.

NOTE.—For horse power of pulleys see pages 301 and 302.

Paper and Iron Friction Gearing



Friction gearing is especially desirable where machinery is frequently thrown in and out of gear, and for reverse motions, being engaged and disengaged by a slight movement of the lever attached to the ECCENTRIC BOX which forms one of the journal bearings, thus dispensing entirely with a clutch. Friction gearing is NOISELESS IN OPERATION, and may be made to transmit any amount of power required, from the lightest to the heaviest, and although more expensive in FIRST COST, is, for long-continued service, MUCH CHEAPER than toothed gearing, as when properly adjusted there is virtually NO WEAR upon it.



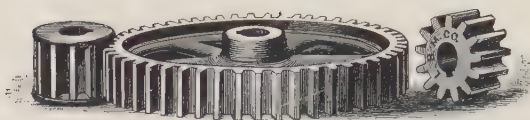
ECCENTRIC BOX

Used for engaging and disengaging
spur friction gearing

Paper and iron friction gears are being extensively adopted in grain elevators, and we have supplied them for driving the heavy machinery in the largest lumber mills, as well as the light, rapid-running tools in watch factories.

Prices on application.

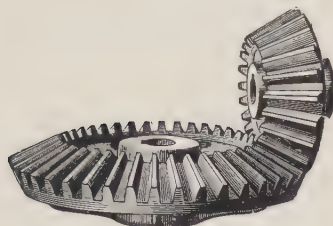
Spur Gearing



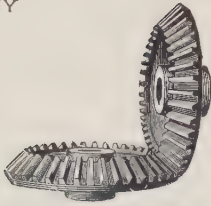
No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Ins.		No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Ins.	
2174	12	1.87	1 3/8	1 3/8		3307	67	32	3 1/2	1 1/2	
4064	21	4.19	1 1/2	1 1/2		9832	67	32	4 3/4	1 1/2	
1983	45	8.95	1 1/2	1 1/2		1512	70	33.42	4 1/2	1 1/2	
4675	11	2.66	1 3/4	1 3/4	Shroud	9312	78	37.251	4	1 1/2	
1852	13	3.13	1 3/4	1 3/4	Shroud	7148	81	38.69	4	1 1/2	
3881	13	3.13	3	1 3/4	Shroud	2616	83	39.65	4	1 1/2	
3149	14	3.34	1 3/4	1 3/4		5565	93	44.42	3 3/4	1 1/2	
3882	40	9.55	2 1/2	1 3/4		770	112	53.48	3 3/4	1 1/2	
2301	18	5	1 1/2	1 3/8		6026	10	5.66	4 1/2	1 3/4	Shroud
2173	10	3.12	2 5/8	1		11806	17	9.47	5	1 3/4	
115 1/2	10	3.12	3 1/2	1	Shroud	224 1/2	21	11.69	5 1/4	1 3/4	Shroud
7702	12	3.80	1 7/8	1		6025	50	27.87	4	1 3/4	
9952	12	3.864	2 1/2	1		3053	10	6.47	5 1/2	2	Shroud
2546	13	4.18	2 1/4	1	Shroud	3085	12	7.73	6 1/2	2	Shroud
3242	13	4.18	4 1/4	1	Shroud	2668	13	8.36	6 1/2	2	Shroud
1038	14	4.49	2 1/4	1		512	14	9	4 1/2	2	Shroud
1955	18	5.76	2 3/4	1	Shroud	87	14	9	5 1/4	2	Shroud
122 1/2	18	5.76	3 1/2	1	Shroud	9801	14	9	6 1/2	2	Shroud
838	25	7.97	2	1	Shroud	10519	15	9.62	5 1/2	2	Shroud
2675	32	10.20	3	1		4500	16	10.25	4 1/2	2	Shroud
9953	50	15.926	2 1/2	1		9949	16	10.25	6 1/2	2	Shroud
1039	50	15.93	2 1/2	1		4547	18	11.52	4 1/2	2	Shroud
6966	66	21.02	3	1		46 1/2	19	12.15	6	2	Shroud
133 1/2	73	23.25	2 1/2	1		9880	20	12.78	4 3/4	2	Shroud
135 1/2	80	25.75	3	1		2780	29	18.50	6	2	
134	12	4.35	3 1/2	1 3/8	Shroud	5423	35	22.32	4	2	
4031	9	3.65	3	1 1/4	Shroud	8716	42	26.76	4	2	
6530	9	3.65	3 1/2	1 1/4	Shroud	828	50	31.85	4	2	
4487	11	4.44	3 1/4	1 1/4	Shroud	3308	57	36.30	5	2	
152 1/2	12	4.83	1 3/4	1 1/4		8709	70	44.57	4	2	
3190	12	4.83	3 1/4	1 1/4	Shroud	6600	70	44.57	5	2	
3610	13	5.22	3	1 1/4	Shroud	3052	81	51.59	5	2	
6398	15	6.01	3 1/2	1 1/4		510	103	65.60	4	2	
8466	17	6.80	3 1/2	1 1/4	Shroud	2667	113	71.95	6	2	
2121	21	8.36	3	1 1/4	Shroud	3608	11	8.87	8 1/2	2 1/2	Shroud
3356	25	9.94	4	1 1/4		2719	15	12.02	6 1/2	2 1/2	
164 1/2	45	17.92	3	1 1/4		611	18	14.40	8 1/4	2 1/2	
11349	54	21.497	3 1/4	1 1/4		6111	19	15.19	7	2 1/2	Shroud
6397	60	23.88	3 1/4	1 1/4		8594	19	15.19	6	2 1/2	Shroud
3609	78	31.05	2 1/2	1 1/4		2038	21	16.77	6 1/2	2 1/2	Shroud
2716	90	35.81	3 1/2	1 1/4		897	23	18.30	8	2 1/2	
6333	100	39.79	2 1/2	1 1/4		8593	23	18.30	9 1/2	2 1/2	
11877	120	47.25	2 1/2	1 1/4		944	24	19.10	8	2 1/2	
7032	12	4.90	2 3/4	1.27		288 1/2	35	27.85	6	2 1/2	
7014	155	62.67	1 1/4	1.27	5 Seg's	4843	46	36.65	6	2 1/2	
7015	217	87.73	1 1/4	1.27	7 Seg's	294 1/2	58	46.15	6	2 1/2	
10401	10	4.85	4 1/2	1 1/2	Shroud	2036	76	60.50	6	2 1/2	
771	12	5.79	3 1/2	1 1/2	Shroud	610	90	71.63	8	2 1/2	
2615	12	5.79	4 1/4	1 1/2	Shroud	2240	91	72.48	8	2 1/2	
2615	12	5.79	4 3/4	1 1/2	Shroud	6016	14	13.44	4 1/2	2.99	
396	13	6.20	3 3/8	1 1/2	Shroud	5564	16	15.33	4 1/2	2.99	
4456	13	6.20	4 1/4	1 1/2	Shroud	6234	17	16.29	4 1/2	2.99	
6013	13	6.20	4 3/4	1 1/2	Shroud	5986	18	17.25	4 1/2	2.99	Long Teeth
9614	15	7.21	4 1/4	1 1/2	Shroud	5563	19	18.17	4 1/2	2.99	
1513	16	7.64	4 1/2	1 1/2	Shroud	5210	20	19.12	4 1/2	2.99	
1501	17	8.12	4	1 1/2	Shroud	6015	26	24.80	4 1/2	2.99	
9022	20	9.588	4 1/2	1 1/2	Shroud	5315	11	10.65	8 3/4	3	Shroud
2953	21	10.06	4	1 1/2	Shroud	6884	13	12.53	9 1/2	3	Shroud
2953	21	10.06	5	1 1/2	Shroud	8657	14	13.48	6	3	Shroud
6065	23	11.01	3	1 1/2		301 1/2	16	15.31	6	3	Shroud
5705	25	11.97	4	1 1/2	Shroud	8658	16	15.31	10 3/4	3	
6051	26	12.44	4	1 1/2		2597	18	17.28	9 3/4	3	Shroud
7147	28	13.39	4	1 1/2		8656	21	20.13	6	3	
5011	31	14.83	4	1 1/2		308 1/2	32	30.75	6	3	
9899	37	17.675	2	1 1/2		5316	32	30.75	8	3	
6050	38	18.16	4	1 1/2		6023	36	34.42	6	3	
6049	43	20.55	4	1 1/2		10528	39	37.28	9	3	
1502	46	21.98	3 1/2	1 1/2		8659	44	42.05	9	3	
8925	49	23.41	3 3/4	1 1/2		9536	25	27.85	5 1/2	3 1/2	Long Teeth
						7306	30	33.48	7	3 1/2	Long Teeth
						10227	30	33.48	12	3 1/2	Shroud
						5819	33	36.83	7	3 1/2	Long Teeth
						10228	20	28.75	15	4 1/2	Shroud

NOTE:—When ordering Spur Pinions we should be advised whether they are to be with or without shrouds

Bevel Gearing



No. of Pattern	No. of Teeth	Pitch Diameter	Face	Pitch Inches	Backing	Proportion
2359	48	15.29	2½	1	2	3 to 1
2360	16	5.12			2 1/8	
2683	66	21.02	2½	1	2 1/8	4½ to 1
2684	15	4.81			2 1/8	
2815	50	19.91	3	1½	2½	3 to 1
2814	17	6.80			2 1/8	
4120	40	15.92	3¼	1¼	1¾	2½ to 1
1558	15	5.97			3/8	
2984	76	30.24	3¼	1¼	3	4½ to 1
1572	17	6.80			2 1/8	
2986	40	15.93	3	1¼	2½	2 to 1
2985	20	7.99			3/8	
8048	49	19.51	3¼	1¼	2¾	2 to 1
8049	25	9.97			2 1/8	
3038	45	21.49	4	1½	2½	3 to 1
2168	15	7.21			2 1/8	
5130	40	19.10	4	1½	2¾	1½ to 1
5131	30	14.32			1 1/8	
10252	56	26.751	3½	1½	3	5½ to 1
10253	11	5.325			1 1/8	
2171	12	6.25	1½	1½	1 1/8	1½ to 1
2172	8	4.12			1 1/8	
8052	67	34.62	4½	1½	3¾	2 to 1
8051	33	17.06			1 1/8	
951	36	20.06	4½	1¾	2 1/8	1½ to 1
2724	24	13.40			3/8	
7283	29	16.18	4½	1¾	1	2 to 1
7282	15	8.42			1 1/8	
10358	35	19.5	5	1¾	2 5/8	2½ to 1
10359	14	7.864			1 1/8	
104½	45	25.08	4½	1¾	4	2¾ to 1
105½	20	11.18			5/8	
3503	60	33.44	4½	1¾	4	3½ to 1
3504	17	9.52			1 1/8	
3585	44	28.04	5½	2	2 5/8	1½ to 1
3583	35	22.31			4	
9279	56	35.65	5	2	2 1/2	3½ to 1
9280	16	10.182			1 1/8	
3593	56	35.66	5½	2	5½	1¾ to 1
3584	31	19.76			1 1/8	
5003	61	38.85	5	2	6	5 to 1
5004	12	7.73			1 1/8	
10260	73	46.5	5	2	6 1/2	6 to 1
10259	12	7.728			1 1/8	
10281	38	30.27	6½	2½	1 1/8 neg	2¾ to 1
10282	14	11.23			1 1/8	short teeth
138½	44	38.75	9	2¾	4 1/8	3 to 1
139½	15	13.37			3 1/8	
7	36	45.89	5	4	1 1/8	3 to 1
8	12	15.45			6 1/8	
2733	57	72.60	5	4	7/2	5 to 1
2734	12	15.45				



Mitre Gearing

No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Inches	Backing	No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Inches	Backing
6516	18	4.31	1 1/4	3/4	1/2	7585	12	4.83	2	1 1/4	1/2
11470 A	25	6	1 1/4	3/4	1/2	11157	17	8.163	2 3/4	1 1/2	1 1/2
4976	18	5.76	1 1/4	3/4	1/2	43 1/2	21	10.37	4	1 1/2	1 1/2
1186	19	6.07	1 1/4	3/4	1/2	5074	33	15.78	4	1 1/2	1 1/2
25 1/2	34	10.84	2 1/2	1	1 1/2	8302	38	18.16	4	1 1/2	1 1/2
1999	37	11.78	2 1/2	1	1 1/2	1509	43	20.55	3 1/2	1 1/2	1 1/2
8017	24	8.14	2	1 1/2	3/4	2749	55	26.27	4	1 1/2	2
4367	18	7.29	2 1/4	1 1/4	1 1/4	5181	20	11.18	4	1 1/4	1 1/4
2813	25	9.97	3 1/4	1 1/4	3/8	1630	38	24.19	6	2	1 1/2
7726	30	11.96	3	1 1/4	3/4	10283	20	15.98	6	2 1/2	1 1/2 g short teeth
						10284	22	21.008	8	3	3 1/2 short teeth
						108 1/2	23		7	3 1/2	

Angle Gearing

No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Inches	Backing	Angle Between Shafts	No. of Pattern	No. of Teeth	Pitch Diam.	Face	Pitch Inches	Backing	Angle Between Shafts
2951	38	15.14	2 3/4	1 1/4	1 1/2	79° 53'	107 1/2	23	24.79	7	3 3/8	4 1/2	110°
4636	64	25.50	3	1 1/4	1 1/2	24° 37' 25"	6921	23	24.79	7	3 3/8	4 1/2	100°
4637	21	8.37	4	1 1/2	2	3° 53' 34"	38	24	30.64	5	4	4 1/2	7° 40'
1883	31	14.80	4	1 1/2	2	52° 15'	313	24	30.64	6	4	2	25°
3011	50	23.89	3 1/2	1 1/2	2	35° 14'	931	24	30.64	5	4	5 3/4	84° 18'
3012	17	8.16	4	1 1/2	2	71° 20'	295	28	36	6	4	5 3/4	130 1/2°
3209	100	47.75	5	2	4 1/4	42°	9	30	38.25	5	4	3 1/4	79 1/2°
3208	33	15.78	5	2	4 1/4	23° 2'	10	15	18.12	5	4	1 1/2	
6848	24	15.32	5	2	4 1/4	60°	3	47	59.87	5	4	3 1/2	
753	30	23.92	5	2 1/2	4 1/4		4	13	16.63	5	4	1 1/4	38°
3210	60	47.77	6	2 1/2	4 1/4		5	47	59.87	5	4	3 3/8	52°
3211	20	15.98	4	3	3		6	13	16.63	5	4	1 1/8	
110 1/2	21	20.05	4	3	3		73 1/2	23	36	5	5	5 1/4	25°
2617	22	21.08	4	3	1 1/4		111 1/2	19	30	5	5	5 1/8	
106 1/2	23	24.79	7	3 3/8	4 1/4								

Worms and Worm Gears



We have a large number of cast iron housings, suitable for either cast or cut worm gears, on which we will quote prices upon application.

No. of Pattern	No. of Teeth	Diam.	Face	Pitch Inches	Remarks
3036	36	10.03	1 3/8	3/4	Right Hand
3037	Worm	3	1 1/8	1	Right Hand
4713	Worm	1 1/8" R.D	1	1 1/8	Right Hand
4714	6	seg 1	3 1/2	1 1/8	Right Hand
7749	113	40.47	3 1/2	1 1/8	Right Hand
7750	Worm	30	3 1/2	1 1/8	Right Hand
2989	Worm	30	3 1/2	1 1/8	Right Hand
2990	Worm	30	3 1/2	1 1/8	Left Hand
6259	Worm	25	11.97	2 1/2	Right Hand
6260	Worm	4.25	60.165	4	Right Hand
7747	Worm	6	5	5	Right Hand
7748	Worm	38.21	10 1/2	2	Right Hand
11186	Worm	30	14.35	3 1/4	Right Hand
11187	Worm	30	14.35	3 1/4	Left Hand
4020	Worm	38	18.16	3 1/4	Right Hand
4021	Worm	6			Double Threaded
1668	Worm				
2467	Worm				
5339	Worm				
5340	Worm				
1692	Worm				
2467	Worm				

The Link-Belt Disk Friction Clutch

Patented December 9, 1879; February 19, 1895; February 11, 1896.

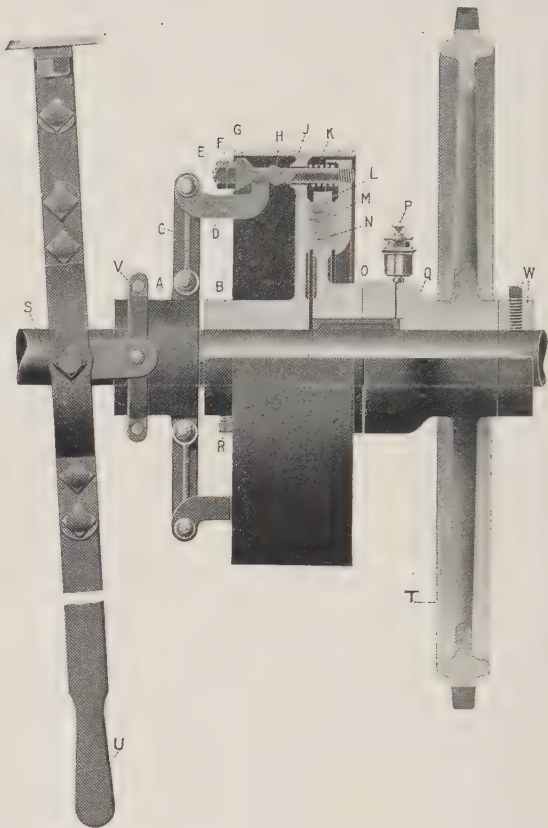
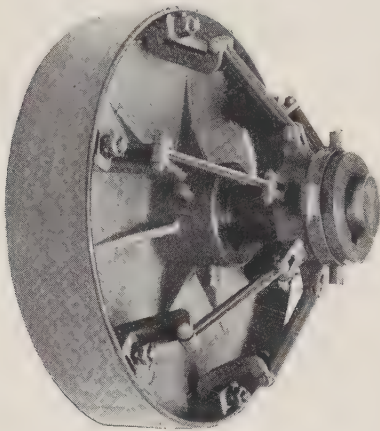
See illustrations page 290.

A Disk Clutch of compact form and simple construction, with large frictional surfaces and powerful grip; self-balanced, self-locking and with ample clearances. The mechanism and operation are fully shown by the perspective and sectional illustrations on page 290.

The loose, or friction disk, carrying a large area of hard-wood friction plugs, is gripped between an exterior ring and the solid plate of the clutch case by levers attached to a sliding ring and compounded by toggles. In throwing out, the release is enforced by spiral springs encircling the bolts.

The H. P. rating of the several sizes is conservative and is based on tests made at Cornell University by the Department of Experimental Engineering. Prof. R. C. Carpenter, who conducted the tests, writes:

“I have looked over your method of rating the friction clutches with a good deal of interest, and it seems to me to be in every way founded on correct principles and to be a conservative value. From our experiments with the clutches I should think there would be no trouble whatever in not only securing the H. P. which you have valued your clutches at, but also in maintaining this rating for an indefinite time. We have in practical use of other clutches found considerable difficulty because of slipping at times, and at other times sticking so that they could not be thrown in or out, and I believe that this is due to the fact that the clutches have been over-rated.
. . . . I do not believe that you will ever be troubled with complaints like those mentioned.”



- A. Shifting spool

B. Clutch hub

C. Thrust link

D. Toggle link

E. Tension bolt

F. Lock nuts

G. Lock washer

H. Toggle washer

J. Clutch shell

K. Spring

L. Friction disk

M. Friction ring

N. Friction block

O. Clutch jaws on disk
- P. Oiler

Q. Jaw hub on wheel

R. Set screw in clutch hub

S. Key

T. Loose sprocket wheel, pulley or gear wheel

U. Operating lever

V. Clutch band

W. Collar

PRICE LIST OF LINK-BELT DISK FRICTION CLUTCH COUPLINGS

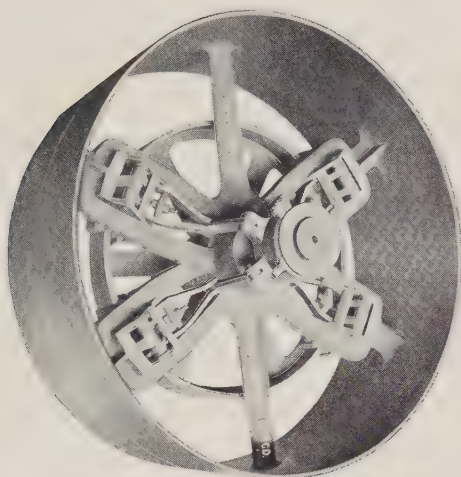
The number of the clutch indicates the outside diameter of the rim.
All clutch couplings, wheels and pulleys are provided with anti-friction bushings.
The two shafts connected by a friction clutch coupling should be supported by bearings as close as possible to the clutch, on each side.

No. of Clutch	Price Including Lever 150 Revs. or less	H. P. at 100 Revs.	Maximum Bore
10	\$35.00	3½	1½
12	40.00	6½	2
14	45.00	11	2½
16	55.00	16	3
18	62.00	27	3½
20	70.00	38	4
24	90.00	60	4½
28	115.00	90	5
32	150.00	125	6

For prices of clutch pulleys, add pulley price to complete clutch price.
For detailed dimensions see page 318.
For space on shaft see page 318.

Ewart Friction Clutch

Patented



Friction Clutches of this general type — wood filled shoes gripping a circular rim — are now recognized as the standards for excellence and are almost exclusively employed where the work is severe or any considerable amount of power is transmitted.

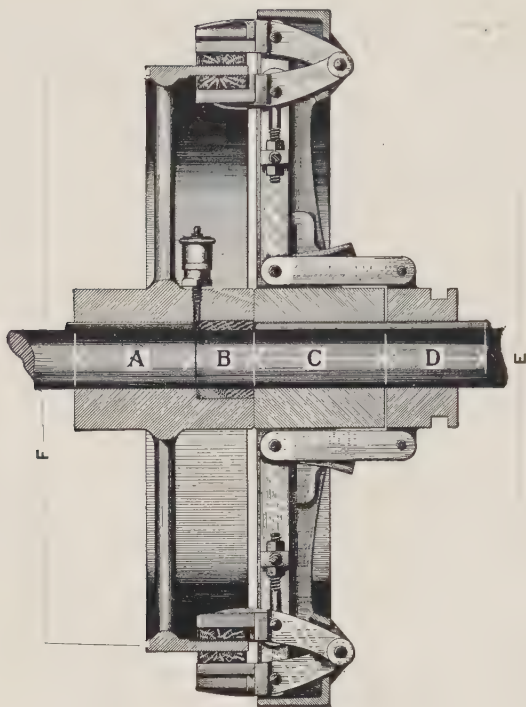
The Ewart Clutch possesses the following advantages, most of which are entirely distinctive, and which are combined in no other clutch :

First.—The gripping arms are connected and supported by a *flanged rim*, which equalizes the starting strains, thus insuring the greatest possible strength and stiffness. This rim completely shields the levers and working parts. In other forms of clutches of this general type, breakages of the unconnected and independent arms, when starting up, are frequent, occasioned by an unequal adjustment of the gripping shoes, one pair of jaws taking hold a moment in advance of the others, thus throwing the entire strain suddenly upon one arm of the clutch ; furthermore, great resistance to the air is offered at high speeds, and the exposed levers are most dangerous.

Second.—The powerful mechanical device—the *toggle*—is used to actuate the gripping shoes, and all the levers and links are made of wrought iron of simplest form.

Third.—*No springs* are employed. The clutch is thrown into and out of engagement positively, and absolutely locked in either position. It is impossible for it to engage itself even partially by centrifugal force, as is the tendency with many clutches.

Fourth.—It can be split as readily as an ordinary pulley and in a similar manner.



CROSS SECTION

Fifth.—The adjustment is most-simple. The only parts ever needing renewal are the wooden shoes, and the jaws grip with uniform pressure.

Sixth.—It occupies minimum space on shaft. The construction is such that, when desired, the clutch mechanism may be cast as a part of pulley or sheave, and the clutch rim used as a driver.

The two shafts connected by a friction clutch coupling should be supported by bearings as close as possible to the clutch, on each side.

PRICES OF EWART FRICTION CLUTCH COUPLINGS

No. of Clutch	Arms	H. P. at 100 Rev.	Max. Bore	Price	Space on Shaft					
					A	B	C	D	E	F
18"	2	9	2 1/8	\$75.00	4 "	2 1/4"	5 "	6 "	22 1/4"	18"
20"	2	10	3 1/8	75.00	4 "	2 1/4"	5 "	6 "	24 1/4"	20"
24"	2	15	4 1/8	90.00	4 1/2"	2 1/2"	6 "	6 1/2"	27 3/4"	24"
20"	4	20	3 1/8	100.00	4 "	2 1/4"	5 "	6 "	24 1/4"	20"
24"	4	30	4 1/8	125.00	4 1/2"	2 1/2"	6 "	6 1/2"	27 3/4"	24"
30"	4	50	4 1/8	160.00	6 "	3 "	6 1/2"	7 1/4"	34 1/4"	30"
36"	4	70	5 1/8	200.00	6 1/2"	3 1/2"	8 "	8 "	42 "	36"
42"	4	115	6 1/8	285.00	7 "	4 "	9 "	9 "	48 1/2"	42"
48"	4	140	7 1/8	350.00	8 "	4 1/2"	9 1/2"	10 3/4"	55 1/4"	48"
54"	4	240	12	555.00	11 "	5 "	10 "	12 1/2"	64 "	54"
66"	4	375	18	875.00	12 1/2"	5 1/2"	13 "	19 "	78 "	66"
42"	6	170	6 1/8	400.00	7 "	4 "	9 "	9 "	48 1/2"	42"
48"	6	205	7 1/8	475.00	8 "	4 1/2"	9 1/2"	10 3/4"	55 1/4"	48"
54"	6	360	12	625.00	11 "	5 "	10 "	12 1/2"	64 "	54"
66"	6	560	18	950.00	12 1/2"	5 1/2"	13 "	19 "	78 "	66"

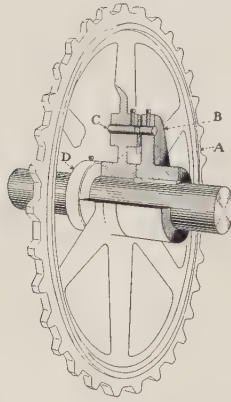
On clutches from 72 inches to 96 inches, specifications and prices will be made on application.

All clutch couplings and clutch pulleys are provided with anti-friction bushings.

We furnish shifter yoke arranged to receive wood or iron lever. In ordering, state whether fulcrum is on opposite or same side of shaft as lever. Former style sent unless otherwise ordered.

Prices on clutch pulleys quoted on receipt of the following particulars: Diameter and face of pulley; diameter and speed of shafting; kind, width and thickness of belt, and approximate estimate of horse power you wish to transmit; does clutch drive pulley, or pulley drive clutch?

Standard Safety Device for Chain Elevators and Conveyors



1543

In all elevators or conveyors which are connected to the source of power by either chain or gears, a safety device, such as shown in the cut, should be interposed.

As usually constructed, it consists of a driving hub "B," keyed to the shaft and connected to the driven wheel "A" by a necked pin "C," the extent of reduction at the neck of pin being determined by the amount of power to be transmitted. Any unusual strain in the elevator or conveyor results in breaking the pin, leaving the driven wheel free to turn and stopping the elevator or conveyor, thereby preventing disaster.

A number of modifications of this device are made, to suit conditions which are not met by the arrangement shown in cut.

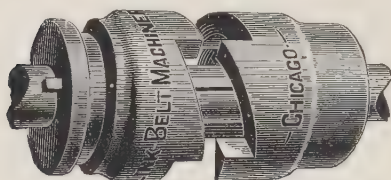
Jaw Clutches



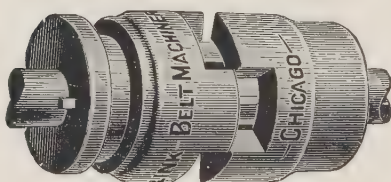
Spiral and Square Tooth Clutches

Spiral Clutches are made right and left hand. A right hand clutch drives when turning to the right as you face the smooth end.

For wheels with spiral jaw hubs, see page 320.



Spiral Clutch Coupling



Square Clutch Coupling

Prices of Spiral and Square Jaw Clutches and Clutch Couplings

No.	Size	Clutch Price	Clutch Coupling	Remarks
3	1 $\frac{5}{8}$	\$2.25	\$4.30	
3 1/2	1 $\frac{3}{4}$	2.85	5.50	
4	1 $\frac{7}{8}$	3.50	6.80	
4 1/2	1 $\frac{1}{2}$	4.20	8.10	
5	1 $\frac{5}{8}$	4.95	9.60	
5 1/2	2 $\frac{3}{16}$	5.75	11.10	
6	2 $\frac{1}{8}$	6.60	12.80	
6 1/2	2 $\frac{1}{2}$	7.50	14.50	
7	2 $\frac{5}{8}$	8.45	16.30	
7 1/2	3 $\frac{3}{8}$	9.45	18.20	
8	3 $\frac{7}{8}$	10.50	20.20	
8 1/2	3 $\frac{1}{2}$	11.60	22.30	
9	3 $\frac{5}{8}$	12.75	24.50	
10	4 $\frac{1}{4}$	15.20	29.30	
11	4 $\frac{5}{8}$	17.85	34.50	
12	5 $\frac{7}{8}$	20.70	40.00	
13	5 $\frac{5}{8}$	23.75	46.00	

When ordering clutches to be used with sprocket wheels, pulleys or gears, be careful to state whether the clutch connects with right or left hand side of wheel when top of same is turning from you; also, whether wheel or clutch is to drive. See page 320 for drawing.

For detailed dimensions see page 319.

Hand Wheels

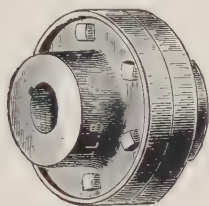


Hand Wheels Bored and Set
Screwed or Key Seated

Pattern No.	Extreme Diameter	Diameter of Rim	Price
4716	3 $\frac{3}{4}$ "	$\frac{1}{2}$ "	\$0.80
7	5 $\frac{1}{4}$ "	$\frac{5}{8}$ "	1.00
2562	7 $\frac{3}{4}$ "	$\frac{7}{8}$ "	1.50
2559	11 $\frac{3}{4}$ "	1 $\frac{1}{8}$ "	1.60
532	12 "	1 $\frac{1}{8}$ "	1.80
7885	12 "	1 "	2.85
3941	14 $\frac{3}{4}$ "	1 $\frac{1}{8}$ "	3.00
1189	15 "	1 $\frac{1}{8}$ "	3.90
2910	18 "	1 $\frac{1}{4}$ "	4.00
2545	24 "	1 "	4.25
2361	30 "	1 $\frac{3}{8}$ "	10.50
264	38 "	1 $\frac{3}{4}$ "	11.10
6854	48 "	2 "	27.00

Turned Shafting, Flanged Face Couplings, Safety Collars

All shafting made straight,
true and turned exactly to
gauge. All shafts above $4\frac{7}{16}$
are of hammered iron.



Flanged Face Couplings WITH TURNED BOLTS

Holes drilled by templets,
therefore interchangeable.



Patent Safety Collar WITH SET SCREWS

Made plain or split.

Finished Shafting		Flanged Face Couplings		Iron Set Collars
Diam. of Shaft	Price per Foot	Keyseats per Foot other than for Couplings Furnished	Price per Pair	Price each
$1\frac{1}{8}$	\$0.70	\$0.30	\$7.50	\$0.70
$1\frac{1}{4}$	.75	.35	7.75	.80
$1\frac{1}{2}$	.80	.40	8.00	1.00
$1\frac{3}{4}$	.87	.45	8.50	1.20
$1\frac{7}{8}$	1.05	.50	9.00	1.40
$2\frac{1}{8}$	1.25	.55	10.50	1.60
$2\frac{1}{4}$	1.50	.60	12.50	1.80
$2\frac{3}{8}$	1.80	.65	15.25	2.10
$2\frac{1}{2}$	2.15	.70	18.25	2.40
$3\frac{1}{8}$	2.60	.80	21.75	2.70
$3\frac{1}{4}$	2.95	.90	25.25	3.00
$3\frac{3}{8}$	3.45	1.00	29.25	3.30
$3\frac{1}{2}$	4.00	1.20	33.25	3.60
$4\frac{1}{8}$	5.30	1.45	43.25	4.70
$4\frac{1}{4}$	6.90	1.75	54.75	5.90
$5\frac{1}{8}$	8.75	2.10	67.00	7.20
$5\frac{1}{4}$	10.85	2.50	81.00	8.60
$6\frac{1}{8}$	13.20	3.00	95.50	10.10
$6\frac{1}{4}$	15.90	3.50	110.00	11.70

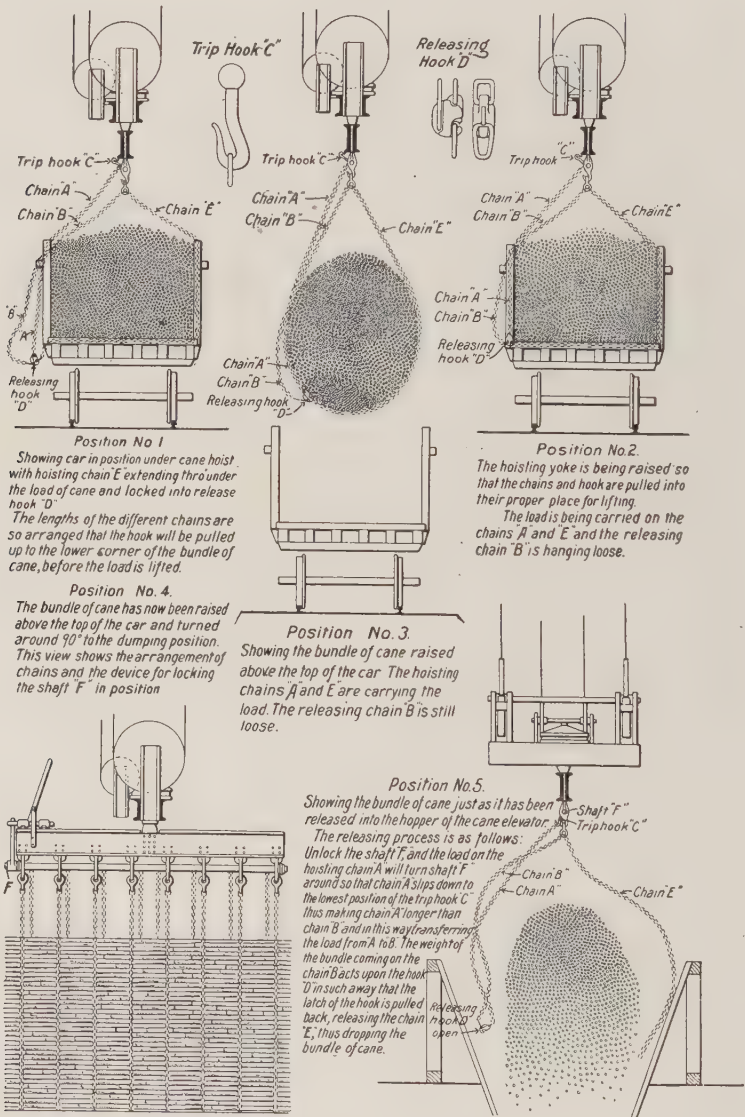
Add 50 cents to the list for Split Collars up to $2\frac{7}{8}$ inches.

Add 25 per cent. for all sizes above $2\frac{7}{8}$ inches.

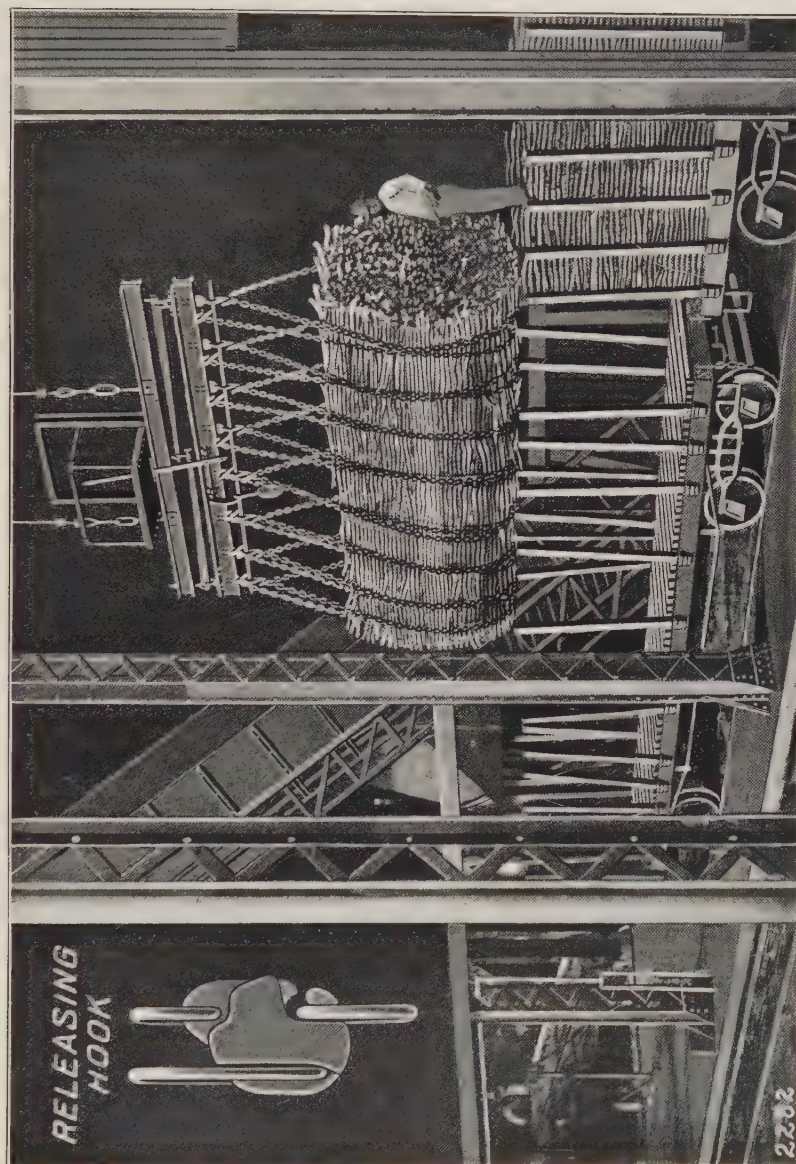
For dimensions of Collars see pages 316 and 317.

The Dodge Automatic Tripping Hook

Patented



Used in handling cane, laths, bar iron and similar products. Hoisting yoke supplied with automatic turning device when necessary.



CHAIN SLINGS EMPLOYING THE DODGE AUTOMATIC TRIPPING HOOKS
At the Plantation of Guanica Centrale Company, Guanica, Porto Rico

Horse-Power of Coal Conveyors

T = Net tons per hour.

L = Length of Conveyor in feet, center to center.

W = Weight of Chain, Flights and Shoes (both runs) in pounds.

S = Speed per minute in feet.

A and *B* = Constants depending on angle of incline from horizontal.

Example: *A* #8/18 Monobar Conveyor 200ft. 4 to 6° inclined 10° from horizontal, with 6" X 18" Flights spaced 18" apart carrying 80 tons of coal per hour @ 100 ft. p.m. will require

$$HP = \frac{.50 \times 80 \times 200 + .01 (400 \times 5.5 + 267 \times 9.2) 100}{1000} = \frac{8000 + 4656}{1000} = 12.66 \text{ HP}$$

This Formula gives the amount of power to be applied to head-shaft and does not allow for loss of power in transmission to the head-shaft.

For Suspended-Flight Conveyor on well greased tracks deduct 20%.

Angle of Incline from Horizontal	A	B	Approx. weight per foot in pounds.					Approx weights of Flights with Return-Shoes and Bolts in pounds.		
			Chain	Flight every 12"	Flight every 18"	Flight every 24"	Flight every 36"	Size	Steel	Mall.Iron
0	.343	.01	78	2.4	2.3	2.26	2.2	4 X 10	3.5	4.3
2	.378	"	88	2.8	2.7	2.6	2.5	4 X 12	3.9	4.7
4	.40	"	85	3.1	2.8	2.7	2.6	5 X 10	4.1	5.2
6	.44	"	103	4.6	4.4	4.3	4.2	5 X 12	4.6	5.7
8	.47	"	108	4.7	4.9	4.4	4.1	5 X 15	5.8	5.9
10	.50	"	110	5.6	5.2	4.9	4.7	6 X 18	8.1	9.2
12	.54	"	114	6.3	6.0	5.9	5.7	8 X 18	10.1	12.7
14	.57	"	122	8.1	7.7	7.4	7.2	8 X 20	11.0	13.4
16	.60	"	124	8.9	8.4	8.2	7.9	8 X 24	12.6	14.4
18	.63	.009	720	5.9	5.6	5.4	5.3	10 X 24	15.2	17.4
20	.66	"	730	6.9	6.6	6.4	6.3	Suspended		
22	.69	"	825	9.6	9.3	9.1	8.9			
24	.72	"	Monobar	Every joint	Every 2nd	Every 3rd	—	4 X 10	13.8	
26	.74	"	612	3.9	3.6	3.5	—	4 X 12	15.5	
28	.77	"	618	3.0	2.8	2.7	—	5 X 10	16.4	
30	.79	"	818	5.7	5.5	5.3	—	5 X 12	17.4	
32	.82	.008	824	4.9	4.7	4.6	—	5 X 15	19.3	
34	.84	"	1018	11.5	10.7	10.4	—	6 X 18	21.5	
36	.86	"	1024	9.6	9.07	8.8	—	8 X 18	29.5	
38	.88	"	1224	14.7	14.04	13.8	—	8 X 20	36.2	
40	.90	"	1236	11.8	11.34	11.2	—	8 X 24	43.5	
42	.92	.007	1424	20.5	19.7	19.4	—	10 X 24	44.5	
44	.94	"	1/2 Dodge	5.1	4.9	4.8	4.7	10 X 36	54.7	
46	.95	"	3/8 "	6.4	6.3	5.9	5.7	10 X 48	64.6	
48	.96	"	3/4 "	—	every 16"	every 24"	every 32"	12 X 64	90.0	
50	.98	.006	13" 16 "	—	every 16"	every 24"	every 32"			
			7" 8 "	12.5	—	11.5	11.2			
			11 1/2	7.7	6.9	6.2	5.7			
			11 1/3	9.5	8.8	8.0	7.5			
			11 3/10	10.5	9.5	9.0	7.8			

Conveying Capacities of Flights

AT 100 FEET PER MINUTE.

TONS OF COAL PER HOUR.

Ratings are for Continuous Feed.

2000 lbs. = 1 Ton.

Size of Flight.	Horizontal				Inclined		
	Every 16"	Every 18"	Every 24"	lbs. Coal per flight	10° Every 24"	20° Every 24"	30° Every 24"
4" x 10"	33.75	30.	22.5	15.	18.	14.25	10.5
4" x 12"	42.75	38.	28.5	19.	24.	18.	13.5
5" x 12"	51.75	46.	34.5	23.	28.5	22.5	16.5
5" x 15"	69.75	62.	46.5	31.	40.5	31.5	22.5
6" x 18"		80.	60.	40.	49.5	40.5	31.5
8" x 18"		120.	90.	60.	72.	57.	48.
8" x 20"			105.	70.	84.	66.5	56.
8" x 24"			135.	90.	120.	96.	72.
10" x 24"			172.5	115.	150.	120.	90.

		Torsional Moments in thousands of inch Pounds =T.																																							
		2.5	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	120	140	160	180	200	220	240	260	280	300	320	340	360	400	440	480	520	560	600					
Bending Moments in thousands of Inch Pounds=M.	2.5	1.47	1.57	1.81	2.0	2.17	2.32	2.44	2.57	3.06																															
	5	1.86	1.85	1.98	2.12	2.25	2.40	2.53	2.62	2.73	2.82	2.89																													
	7.5	2.09	2.08	2.12	2.25	2.35	2.47	2.59	2.70	2.79	2.89	2.96																													
	10	2.29	2.32	2.29	2.37	2.47	2.57	2.66	2.76	2.86	2.93	3.02	3.19	3.31																											
	12.5	2.46	2.50	2.46	2.59	2.63	2.66	2.76	2.82	2.92	2.99	3.06	3.21	3.35																											
	15	2.64	2.64	2.64	2.66	2.72	2.78	2.85	2.91	2.98	3.05	3.12	3.26	3.41	3.52	3.63																									
	20	2.89	2.91	2.93	2.92	2.92	2.96	3.01	3.07	3.13	3.19	3.24	3.35	3.47	3.59	3.71	3.81	4.02																							
	25	3.10	3.11	3.14	3.14	3.14	3.19	3.23	3.27	3.33	3.38	3.46	3.58	3.67	3.76	3.86	4.06	4.23																							
	30	3.29	3.31	3.40	3.38	3.33	3.33	3.34	3.40	3.43	3.52	3.57	3.68	3.76	3.85	3.93	4.12	4.27	4.45																						
	35	3.45	3.34	3.49	3.54	3.51	3.50	3.52	3.53	3.55	3.58	3.62	3.68	3.75	3.85	3.95	4.04	4.17	4.33	4.48	4.62																				
	40	3.61	3.62	3.63	3.67	3.68	3.68	3.67	3.65	3.68	3.71	3.73	3.79	3.88	3.95	4.04	4.12	4.23	4.39	4.60	4.66	4.79																			
	45	3.74	3.76	3.78	3.85	3.83	3.81	3.81	3.83	3.85	3.87	3.89	3.96	4.05	4.11	4.19	4.30	4.45	4.65	4.71	4.83	4.95																			
	50	3.88	3.90	3.91	3.94	4.01	3.99	3.97	3.95	3.96	3.97	4.00	4.06	4.12	4.18	4.26	4.36	4.51	4.72	4.75	4.87	5.00	5.12	5.22																	
	60	4.14	4.17	4.19	4.23	4.26	4.22	4.19	4.19	4.19	4.22	4.26	4.29	4.34	4.41	4.52	4.65	4.84	4.86	4.95	5.07	5.18	5.29	5.39	5.49																
	70	4.35	4.36	4.38	4.39	4.48	4.48	4.45	4.43	4.43	4.44	4.45	4.47	4.51	4.56	4.65	4.77	4.93	4.97	5.06	5.18	5.25	5.37	5.46	5.55	5.64	5.74														
	80	4.55	4.56	4.58	4.59	4.65	4.65	4.64	4.63	4.62	4.63	4.63	4.66	4.70	4.77	4.90	5.05	5.06	5.15	5.24	5.35	5.43	5.52	5.60	5.73	5.79	5.86	6.07													
	90	4.72	4.74	4.75	4.77	4.78	4.80	4.88	4.85	4.80	4.80	4.80	4.83	4.89	4.92	5.04	5.18	5.18	5.28	5.36	5.42	5.50	5.58	5.68	5.78	5.85	5.93	6.10	6.26	6.40											
	100	4.93	4.94	4.95	4.96	4.98	4.99	4.96	4.93	4.92	4.93	4.95	5.00	5.08	5.18	5.24	5.32	5.42	5.50	5.58	5.66	5.76	5.85	5.89	6.00	6.14	6.30	6.44	6.59	6.72											
	110	5.10	5.11	5.13	5.14	5.22	5.10	5.07	5.07	5.06	5.12	5.19	5.26	5.35	5.42	5.50	5.57	5.66	5.75	5.83	5.89	5.98	6.05	6.22	6.34	6.49	6.61	6.76	6.89												
	120	5.25	5.27	5.31	5.25	5.22	5.21	5.23	5.25	5.31	5.35	5.44	5.50	5.58	5.66	5.74	5.88	5.96	5.96	6.04	6.11	6.26	6.37	6.59	6.75	6.92	7.03														
	130	5.43	5.42	5.40	5.38	5.37	5.39	5.42	5.47	5.53	5.62	5.67	5.75	5.82	5.88	5.96	6.04	6.10	6.17	6.31	6.40	6.57	6.70	6.83	6.96																
	140	5.53	5.50	5.49	5.51	5.53	5.58	5.63	5.68	5.76	5.80	5.88	5.96	6.03	6.10	6.17	6.24	6.37	6.51	6.63	6.75	6.87	7.00																		
	150	5.62	5.62	5.64	5.65	5.68	5.73	5.78	5.84	5.89	5.98	6.05	6.11	6.16	6.23	6.30	6.42	6.55	6.68	6.79	6.92	7.03																			
	170	S = Working Stress	= 13500 lbs when $\frac{W}{S} = 1$ or less } assuming,																				586588.592598 601 606 613 619 624 630 636 642 653 666 678 689 700 712																		
	190	S = "	= 8750" - $\frac{W}{S}$: 2 or more } 250 lb. TS																				611 613 619 623 628 633 637 643 650 654 665 677 688 699 710 721																		
	210	S = "	is proportional for intermediate values of $\frac{W}{S}$																				635 638 642 647 651 656 661 667 677 687 698 709 718 729																		
	240																						665 668 672 677 680 685 694 703 715 723 733 743																		
	270	$T_1 = M + \sqrt{M^2 + T^2}$																					693 697 699 703 711 720 730 737 745 758																		
	300																						719 723 729 736 743 752 760 770																		

EXAMPLE.-----A conveyor has a 42-inch head-wheel spaced midway between bearings 48 inches apart center to center. The chain pull is 5,000 pounds. The bending moment is $\frac{5,000}{2} \times \frac{1.8}{2} = 60,000$ inch pounds. The torsional moment is $5,000 \times \frac{1.8^2}{2} = 105,000$ inch pounds. From the table, the shaft should be about 4.44 inches ($4\frac{7}{16}$) diameter.

Horse Power of Pulleys

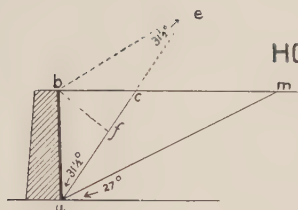
AT 100 R.P.M.

Working Strain of Belt-55 lbs. per 1" of width

Multiply $\times \frac{1}{2}$ for Double Belts.

Diam. of Pulley	Width of Single Leather Belts.													
	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
6	.5	.8	1.1	1.4	1.6	2.1	2.6	3.0	3.6	4.0	4.6	5.2	5.6	6.2
7	.6	1.0	1.3	1.6	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2
8	.7	1.2	1.4	1.8	2.1	2.8	3.4	4.1	4.8	5.4	6.2	6.9	7.6	8.2
9	.8	1.2	1.6	2.0	2.4	3.1	3.8	4.6	5.4	6.2	7.0	7.8	8.6	9.3
10	.9	1.4	1.8	2.2	2.6	3.4	4.2	5.2	6.0	6.9	7.8	8.6	9.6	10.3
11	1.0	1.5	2.0	2.4	2.9	3.8	4.8	5.7	6.6	7.6	8.6	9.5	10.4	11.4
12	1.1	1.6	2.1	2.6	3.1	4.2	5.2	6.2	7.2	8.2	9.4	10.4	11.4	12.4
13	1.2	1.8	2.3	2.8	3.4	4.5	5.6	6.8	7.9	9.0	10.2	11.2	12.4	13.4
14	1.3	1.9	2.5	3.0	3.6	4.8	6.0	7.2	8.5	9.7	11.0	12.2	13.4	14.5
15	1.35	2.0	2.7	3.2	3.9	5.2	6.4	7.8	9.1	10.4	11.7	13.0	14.3	15.5
16	1.4	2.1	2.8	3.4	4.2	5.5	7.0	8.3	9.7	11.0	12.5	13.9	15.3	16.6
17	1.5	2.2	3.0	3.7	4.4	5.9	7.3	8.8	10.3	11.8	13.2	14.8	16.2	17.6
18	1.6	2.4	3.1	4.0	4.8	6.2	7.8	9.3	11.0	12.4	14.0	15.6	17.2	18.7
19	1.7	2.6	3.4	4.2	5.0	6.6	8.2	9.9	11.6	13.2	14.8	16.5	18.2	19.8
20	1.8	2.7	3.6	4.4	5.2	7.0	8.7	10.4	12.2	13.9	15.6	17.4	19.2	20.8
21	1.9	2.9	3.7	4.6	5.5	7.3	9.1	11.0	12.8	14.6	16.4	18.2	20.1	21.9
22	1.95	3.0	3.9	4.8	5.8	7.6	9.6	11.4	13.4	15.2	17.2	19.2	21.1	22.9
23	2.0	3.1	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0
24	2.1	3.2	4.1	5.2	6.3	8.4	10.4	12.7	14.6	16.7	18.8	20.9	23.0	25.0
25	2.2	3.3	4.4	5.4	6.6	8.7	10.8	13.0	15.2	17.4	19.6	21.8	24.0	26.0
26	2.3	3.5	4.6	5.7	6.8	9.0	11.3	13.6	15.9	18.0	20.4	22.6	25.0	27.1
27	2.4	3.6	4.8	5.9	7.0	9.4	11.8	14.1	16.5	18.8	21.2	23.5	26.0	28.2
28	2.5	3.8	5.0	6.1	7.4	9.8	12.2	14.6	17.1	19.5	22.0	24.4	26.9	29.2
29	2.6	3.9	5.1	6.4	7.6	10.1	12.6	15.2	17.8	20.2	22.8	25.3	27.9	30.2
30	2.65	4.0	5.3	6.6	8.0	10.4	13.0	15.7	18.4	20.9	23.6	26.2	28.8	31.3
31	2.7	4.1	5.5	6.8	8.2	10.8	13.5	16.2	19.0	21.6	24.4	27.0	29.8	32.4
32	2.8	4.3	5.7	7.0	8.4	11.2	14.0	16.7	19.6	22.4	25.2	28.0	30.7	33.4
33	2.9	4.4	5.8	7.2	8.7	11.6	14.4	17.2	20.2	23.0	26.0	28.8	31.7	34.5
34	3.0	4.6	6.0	7.4	9.0	11.9	14.8	17.8	20.8	23.8	26.8	29.6	32.6	35.6
35	3.1	4.7	6.2	7.6	9.2	12.2	15.2	18.3	21.4	24.4	27.6	30.6	33.6	36.6
36	3.1	4.8	6.4	7.9	9.4	12.6	15.6	18.8	22.0	25.2	28.3	31.4	34.6	37.6

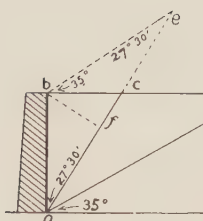
Continued on page 302.



HORIZONTAL PRESSURE EXERTED BY ANTHRACITE COAL AGAINST VERTICAL RETAINING WALLS PER FOOT OF LENGTH

Weight of Coal—52 lbs. per cu. ft.

Depth—feet in feet	Horizontal Surface		Sloping Surface		Depth—feet in feet	Horizontal Surface		Sloping Surface	
	Total Pressure	Pressure on lowest ft	Total Pressure	Pressure on lowest ft		Total Pressure	Pressure on lowest ft	Total Pressure	Pressure on lowest ft
1	9.78	9.78	14.22	14.22	26	6611.1	498.78	9612.8	725.21
2	39.12	29.34	56.88	42.66	27	7129.5	518.35	10366.	753.67
3	88.02	48.90	127.98	71.10	28	7667.6	537.90	11149.	782.10
4	156.48	68.46	227.52	99.54	29	8225.0	557.46	11988.	810.54
5	244.50	88.02	355.50	127.98	30	8802.0	577.01	12797.	839.0
6	352.08	107.58	511.92	156.42	31	9398.5	596.59	13665.	867.41
7	479.22	127.14	696.78	184.86	32	10015.	616.14	14561.	895.86
8	625.92	146.70	910.08	213.30	33	10650.	635.70	15486.	924.30
9	792.18	166.26	1151.82	241.74	34	11306.	655.26	16439.	952.7
10	978.00	185.82	1422.00	270.18	35	11980	674.81	17420.	981.19
11	1183.38	205.38	1720.62	298.62	36	12675.	694.39	18429.	1009.6
12	1408.32	224.94	2047.68	327.06	37	13389.	713.94	19467.	1038.1
13	1652.82	244.50	2403.18	355.50	38	14123.	733.50	20533.	1066.5
14	1916.88	264.06	2787.12	383.94	39	14875.	753.07	21629.	1095.0
15	2200.50	283.62	3199.5	412.38	40	15648.	772.63	22752.	1123.4
16	2503.68	303.18	3640.32	440.82	41	16440.	792.20	23904.	1151.8
17	2826.42	322.74	4109.56	469.26	42	17252.	811.74	25084.	1180.3
18	3168.72	342.30	4607.28	497.70	43	18083.	830.73	26293.	1208.7
19	3530.58	361.86	5133.42	526.14	44	18934.	850.86	27530.	1237.2
20	3912.00	381.42	5688.0	554.58	45	19804.	870.41	28793.	1265.6
21	4313.00	400.98	6271.0	583.26	46	20695.	889.99	30090.	1294.0
22	4733.5	420.54	6882.5	611.46	47	21605.	909.54	31412.	1322.3
23	5173.7	440.10	7522.5	639.90	48	22533.	929.10	32763.	1350.9
24	5633.3	459.67	8190.7	668.35	49	23482.	948.66	34143.	1379.4
25	6112.6	479.22	8887.5	696.79	50	24450.	968.21	35550.	1407.9



HORIZONTAL PRESSURE EXERTED BY BITUMINOUS COAL

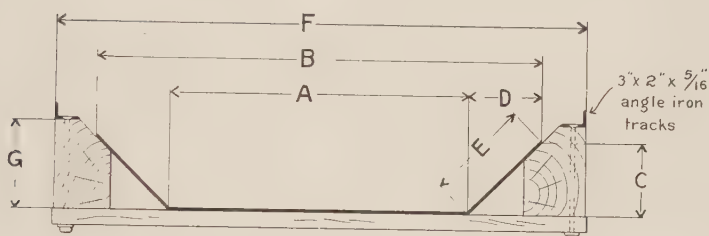
AGAINST VERTICAL RETAINING WALLS

PER FT. OF LENGTH.

Weight of coal—50 lbs. per cu. ft.

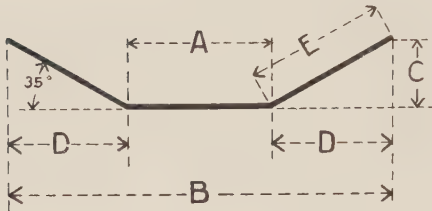
Depth in ft.	Horiz. Surface <i>bm</i>		Sloping Surf. <i>be</i>		Depth in ft.	Horiz. Surface <i>bm</i>		Sloping Surf. <i>be</i>	
	Total Pressure	Pressure lowest ft.	Total Pressure	Pressure lowest ft.		Total Pressure	Pressure lowest ft.	Total Pressure	Pressure lowest ft.
1	6.4	6.4	10	10	26	4305.	325.	6760.	510
2	25.	19.	40	30	27	4641.	338.	7290.	530
3	57.	32.	90	50	28	4993.	350.	7840.	550
4	102.	45.	160	70	29	5358.	363.	8410.	570
5	159.	57.	250	90	30	5732.	376.	9000.	590
6	229.	70.	360	110	31	6122.	389.	9610.	610
7	312.	83.	490	130	32	6523.	401.	10240.	630
8	407.	96.	640	150	33	6935.	414.	10890.	650
9	516.	108.	810	170	34	7362.	427.	11560.	670
10	637.	121.	1000	190	35	7778.	440.	12250.	690
11	770.	134.	1210	210	36	8253.	452.	12960.	710
12	917.	146.	1440	230	37	8754.	465.	13690.	730
13	1076.	159.	1690	250	38	9193.	478.	14440.	750
14	1248.	172.	1960	270	39	9682.	490.	15210.	770
15	1433.	185.	2250	290	40	10192.	503.	16000.	790
16	1630.	197.	2560	310	41	10669.	516.	16810.	810
17	1840.	210.	2890	330	42	11236.	529.	17640.	830
18	2063.	223.	3240	350	43	11797.	541.	18490.	850
19	2298.	236.	3610	370	44	12331.	554.	19360.	870
20	2548.	248.	4000	390	45	12968.	567.	20250.	890
21	2809.	261.	4410	410	46	13478.	580.	21160.	910
22	3083.	274.	4840	430	47	14100.	592.	22090.	930
23	3369.	287.	5290	450	48	14679.	605.	23040.	950
24	3669.	299.	5760	470	49	15275.	618.	24010.	970
25	3981.	312.	6250	490	50	15925.	631.	25000.	990

*Dimensions of
Troughs and Tracks
For
Suspended Flights*



Size of Flight Inches	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches
6 X 14	7 $\frac{3}{4}$	18	5	5 $\frac{1}{8}$	7 $\frac{1}{8}$	23 $\frac{5}{8}$	5 $\frac{1}{2}$
8 X 19	9 $\frac{1}{4}$	23	6 $\frac{3}{4}$	6 $\frac{7}{8}$	9 $\frac{9}{16}$	28 $\frac{5}{8}$	7 $\frac{7}{16}$
10 X 26	20 $\frac{1}{2}$	30 $\frac{1}{2}$	7 $\frac{1}{4}$	5	8 $\frac{3}{4}$	37 $\frac{1}{2}$	7 $\frac{7}{8}$
10 X 30	24 $\frac{1}{2}$	34 $\frac{1}{2}$	7 $\frac{1}{4}$	5	8 $\frac{3}{4}$	41 $\frac{1}{2}$	7 $\frac{7}{8}$
10 X 36	30 $\frac{1}{2}$	40 $\frac{1}{2}$	7 $\frac{1}{4}$	5	8 $\frac{3}{4}$	47 $\frac{1}{2}$	8

Dimensions of Standard
Trough Sections
For
Anthracite Coal



Size of Flight Inches	A Inches	B Inches	C Inches	D Inches	E Inches	Length Inches
4X10	6¼	16	3¾	4⅞	5⅞	25
4X12	7¾	18	3½	5	6⅞	..
5X10	6¼	19¼	4½	6½	7⅞	..
5X12	7¾	21	4⅝	6⅝	8⅞	..
5X15	9¼	23	4⅞	6⅞	8¾	..
6X18	11¼	26½	5¾	7¾	9¾	..
8X18	11¼	31½	7	10⅞	12¾	..
8X20	12¼	36¾	8½	12¾	14⅞	..
8X24	14¾	42	9½	13¾	16¾	..
10X24	14¾	42	9½	13¾	16¾	..
10X48	30½	64½	11¾	16¾	20¾	48"
12X64	46¼	70¼	12	12	17	48"

Data for
Carrying Capacities of Elevators.

**Spaced Malleable
Iron Buckets.**

	Length Inches	Projection Inches	Depth Inches	Capacity Cubic Inches
Style "A"	4	2 3/4	2 1/2	13
	5	3 1/2	3	25
	6	4	3 1/2	50
	7	4 1/2	4	60
	8	5	4	108
	10	6	5	160
	12	6	5 1/2	250
	12	7	5 1/2	300
	14	7	5 1/2	350
	16	8	7	650
Style "B"	18	10	7	1175
	4	1 1/2	1	4
	8	3 1/2	2 1/2	48
	10	4	3	60
	12	5 1/2	4	135
	8	4 1/2	4	84
	10	5	4	120
	12	5	4	144
	14	7	5 1/2	332
	16	7	5 1/2	380

**Malleable-End
Buckets.**

Length Inches	Projection Inches	Depth Inches	Capacity Cubic Inches
12	7	7 3/8	340
14	7	7 3/8	400
16	7	7 3/8	460
18	7	7 3/8	510
20	7	7 3/8	560
12	8	8	430
14	8	8	500
16	8	8	575
18	8	8	630
20	8	8	720
24	8	8	790
30	8	8	1080
36	8	8	1200
12	9	8 5/8	500
14	9	8 5/8	585
16	9	8 5/8	670
18	9	8 5/8	750
20	9	8 5/8	830
24	9	8 5/8	1000
30	9	8 5/8	1250
36	9	8 5/8	1500

Perfect Discharge Elevators
*may run at any speed from 80 ft. to 200 ft.
per minute.*

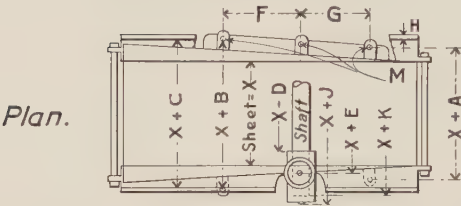
Centrifugal Discharge Elevators
*are usually speeded
as follows:*

Head Wheel Pitch Dia. Inches	Revolutions per minute	Feet per minute
15	42	165
18	40	188
21	38	209
24	37	232
27	36	254
30	35	274
33	34	294
36	34	320
40	33	345
48	32	402

Weight
*per Cubic Foot
(in Pounds)
of
Various Materials.*

Ashes (damp)	43
Cement	88
Clay	63
Coke	30
Coal (Anthracite)	52
Coal (Bituminous)	50
Earth	70
Sand	90
Stone (crushed)	100

Dimensions of Curved Front
 Elevator Boots.

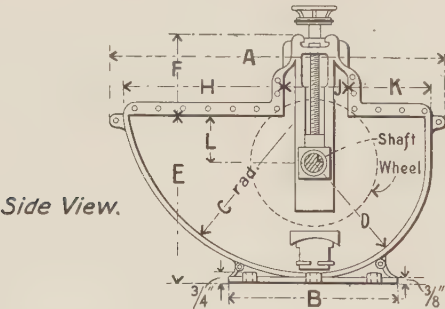


X = Width of Sheet.
(Width of Sheet = Length of Bucket + 2" (angle iron guides, when used).

For Double Strand Elevators

with G. & L. make (X-D) = distance to 1st of chains + width of link.

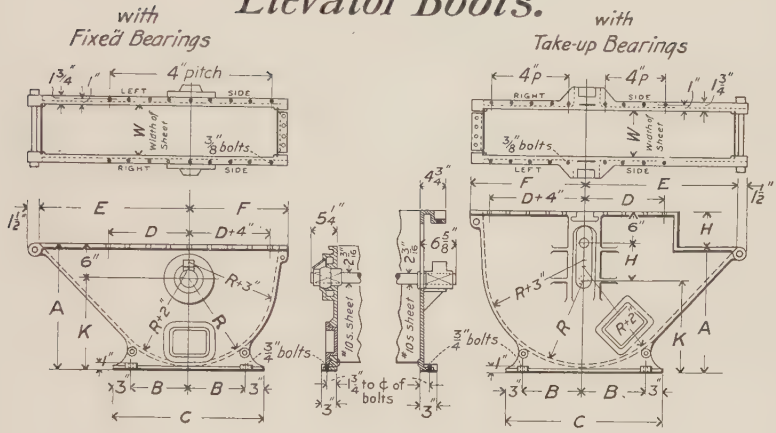
No. of Boot	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	J Inches	K Inches	M (bolts)	
	Btwn holes in floor Flanges	Btwn holes in floor Flanges	Between upper Flanges	Between Bearings	⌀ to ⌀ Take up Screws	Btwn holes in floor Flanges	Btwn holes in floor Flanges	Thickness of upper Flanges	Dist out to out of lips on slides	Length of Shaft	No.	Size
5	2 3/4	4	4 3/4	1 1/16	1 7/8	7 7/8	7 7/8	3/8	8 3/4	5 1/4	4	1/2"
7	6	7	6 3/4	2	2 1/4	7 1/4	7 3/4	3/8	10 3/4	7 1/4	4	5/8"
9	6 1/4	7 1/2	7 3/4	3 1/2	2 1/2	10	9 1/4	1/2	12	8 1/2	4	5/8"
12	6 1/2	8 1/4	10	2 7/8	3 1/4	18 3/8	17 3/8	1/2	13 3/4	9 3/4	6	5/8"
⊙ 15	6 1/2	9 3/4	11	2 7/8	4 1/4	22	20 1/4	1/2	14 1/4	see	6	5/8"
⊙ 18	5	5	11 3/8	5 1/4	2 1/2	20 1/2	20 1/2	1/2	14	note	6	5/8"



⊙ The length of shaft,
 for the ⊙ 15 and ⊙ 18
 Boots, varies accord-
 ing to length of the
 buckets used.

No.	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	H Inches	J Inches	K Inches	L Inches	Shaft Inches	Wheel Inches	Buckets Inches
5	30 1/4	18	19	11 1/8	15 3/4	8 1/2	11 1/2	8 3/8	7 3/8	3 3/8	1 3/8	10 or 12	2 x 2 to 6 x 4
7	43 1/2	24	24	16	21 1/2	11	19 3/8	9 3/8	11 1/4	4 1/4	1 1/8	16 or 18	7 x 4 1/2 to 20 x 6
9	53	29 3/8	28 1/2	19	25	14 1/4	23	11 1/4	13 3/4	4 3/4	2 3/8	20	10 x 7 to 20 x 7
12	59 3/4	36	33 1/2	22	29 3/4	16 3/4	26 3/4	13 1/4	15 3/4	6 3/8	2 7/8	20 or 24	12 x 8
15	72 1/2	42 1/4	39 3/8	28	35 3/4	16 3/4	32 3/4	13 1/4	25	6 1/2	2 7/8	30	18 x 10
18	89	47	46 3/4	34 1/4	41 3/4	19	40 1/4	13 3/4	30	6 1/4	2 1/8	37	12

Dimensions of Straight Front
Elevator Boots.



R	A	B	C	D	E	F	H	K
Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
16 1/2	24	12	30	16	29	22	7	18
20 1/2	28 1/2	15	36	20	35 7/8	26	10	22 1/2
22 1/2	30	16	38	22	36 1/4	28	10	24

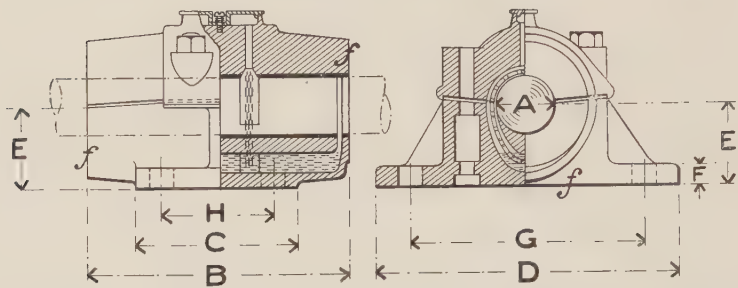
NOTE. For width of bottom sheet of Perfect Discharge Elevators, allow 1" clearance each side. In all other cases, allow 2" clearance.

		MAXIMUM PITCH DIAMETER OF FOOT WHEELS.														
		P.D. = O - 2P. P = Projection of Bucket; O, in table.														
Boot		CHAIN														
		85	88	95	103	103	108	110	122	710	730	744	823	825	835	844
16 1/2	O	30 1/4	30 5/8	30 3/8	30 3/8	30 3/8	30 5/8	30 5/8	29 3/4	30 3/8	30	29 3/4	30 1/2	29 3/4	29 3/4	29 5/8
20 1/2	O	38 1/4	38 5/8	38 3/8	38 3/8	38 3/8	38 5/8	38 5/8	37 3/4	38 3/8	38	37 3/4	38 1/2	37 3/4	37 3/4	37 5/8
22 1/2	O	42 1/4	42 5/8	42 3/8	42 3/8	42 3/8	42 5/8	42 5/8	41 3/4	42 3/8	42	41 3/4	42 1/2	41 3/4	41 3/4	41 5/8

With wheels determined as above, clearance is 1/2"

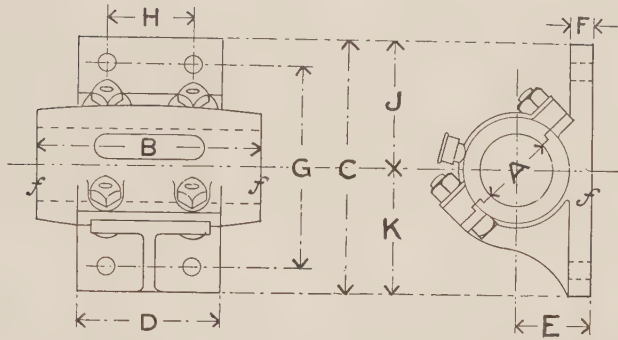
° K' attachments; all others K²

Dimensions of
Chain-oiling Pillow Blocks



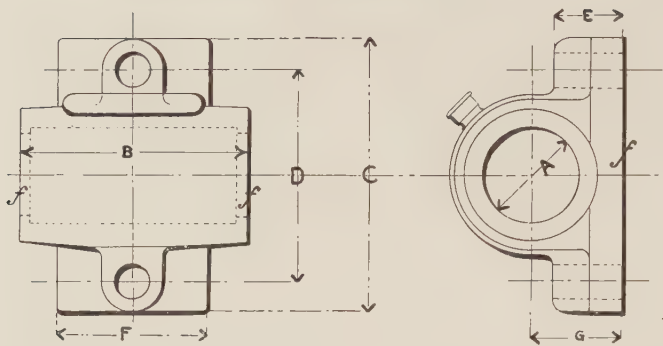
A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	Bolts in Base	
								No.	Size.
2 ³ / ₁₆	6 ³ / ₄	4 ³ / ₄	9 ¹ / ₄	2 ¹ / ₄	3/ ₄	7 ¹ / ₈	2 ¹ / ₂	4	5/ ₈
2 ⁷ / ₁₆	7 ¹ / ₂	5	9 ³ / ₄	2 ¹ / ₂	7/ ₈	7 ⁵ / ₈	3	4	5/ ₈
2 ¹⁵ / ₁₆	9	5 ¹ / ₄	10 ³ / ₄	3	1	8 ¹ / ₂	3 ¹ / ₂	4	3/ ₄
3 ⁷ / ₁₆	10 ¹ / ₂	6 ¹ / ₂	12	3 ¹ / ₂	1	9 ¹ / ₂	4	4	3/ ₄
3 ¹⁵ / ₁₆	12	8	14	4	1 ¹ / ₈	11	5	4	3/ ₄
4 ⁷ / ₁₆	13 ¹ / ₂	8 ¹ / ₂	16 ¹ / ₄	4 ¹ / ₂	1 ¹ / ₄	13	5 ¹ / ₂	4	7/ ₈
4 ¹⁵ / ₁₆	15	11	18 ¹ / ₂	5	1 ³ / ₈	15	7 ¹ / ₂	4	7/ ₈
5 ⁷ / ₁₆	16 ¹ / ₂	11	19 ¹ / ₂	5 ¹ / ₂	1 ¹ / ₂	16 ¹ / ₄	7 ¹ / ₂ variable	4	1
5 ¹⁵ / ₁₆	18	12	21 ¹ / ₄	6	1 ⁵ / ₈	17 ³ / ₄	7 ¹ / ₂	4	1
6 ⁷ / ₁₆	19 ¹ / ₂	9 ¹ / ₂	23 ¹ / ₂	6 ¹ / ₂	1 ⁵ / ₈	18 ¹ / ₂	—	2	1 ¹ / ₄
6 ¹⁵ / ₁₆	21	10	24 ¹ / ₂	7	1 ³ / ₄	19 ¹ / ₂	—	2	1 ¹ / ₄
7 ¹ / ₂	22 ¹ / ₂	11	27	8	2	21 ³ / ₄	—	2	1 ¹ / ₄
8	24	11	27	8	2	21 ³ / ₄	—	2	1 ¹ / ₄
8 ¹ / ₂	25 ¹ / ₂	12	30 ¹ / ₂	9	2 ¹ / ₂	24 ¹ / ₂	—	2	1 ⁵ / ₈
9	27	12	30 ¹ / ₂	9	2 ¹ / ₂	24 ¹ / ₂	—	2	1 ⁵ / ₈
9 ¹ / ₂	28 ¹ / ₂	12	32	10 ¹ / ₂	2 ¹ / ₂	25 ¹ / ₂	—	2	1 ³ / ₄
10	30	12	32	10 ¹ / ₂	2 ¹ / ₂	25 ¹ / ₂	—	2	1 ³ / ₄
10 ¹ / ₂	31 ¹ / ₂	12	32	10 ¹ / ₂	2 ¹ / ₂	25 ¹ / ₂	—	2	1 ³ / ₄

Rigid Pillow Blocks.
Standard Pattern.



A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	J Inches	K Inches	Bolts In Base
1 ⁷ / ₁₆	4 ¹ / ₂	8	3 ¹ / ₂	2	³ / ₄	6 ¹ / ₄	2	4	4	¹ / ₂ "
1 ¹¹ / ₁₆	5 ¹ / ₄	8 ¹ / ₂	4	2 ³ / ₈	³ / ₄	6 ¹ / ₂	2 ¹ / ₄	4 ¹ / ₄	4 ¹ / ₄	¹ / ₂ "
1 ¹⁵ / ₁₆	6	9	4 ¹ / ₂	2 ⁵ / ₈	⁷ / ₈	7	2 ¹ / ₂	4 ¹ / ₂	4 ¹ / ₂	¹ / ₂ "
2 ³ / ₁₆	6 ³ / ₄	9 ¹ / ₄	4 ³ / ₄	2 ³ / ₄	⁷ / ₈	7 ¹ / ₈	2 ¹ / ₂	4 ⁵ / ₈	4 ⁵ / ₈	⁵ / ₈ "
2 ⁷ / ₁₆	7 ⁵ / ₈	9 ³ / ₄	5	2 ⁷ / ₈	¹⁵ / ₁₆	7 ¹ / ₁₆	3	4 ⁷ / ₈	4 ⁷ / ₈	⁵ / ₈ "
2 ¹¹ / ₁₆	8 ⁷ / ₁₆	10 ¹ / ₄	5 ¹ / ₄	3	¹⁵ / ₁₆	8 ¹ / ₈	3	5 ¹ / ₈	5 ¹ / ₈	⁵ / ₈ "
2 ¹⁵ / ₁₆	9	10 ³ / ₄	5 ³ / ₄	3 ³ / ₈	1	8 ⁷ / ₁₆	3 ¹ / ₂	5 ³ / ₈	5 ³ / ₈	³ / ₄ "
3 ¹ / ₁₆	10 ¹ / ₂	12	6 ¹ / ₂	3 ⁵ / ₈	1 ¹ / ₁₆	9 ¹ / ₂	4	6	6	³ / ₄ "
3 ⁵ / ₁₆	12	14	8	4	1 ¹ / ₈	11	5	7	7	³ / ₄ "
4 ¹ / ₁₆	13 ¹ / ₂	16 ¹ / ₄	8 ¹ / ₂	5 ¹ / ₂	1 ¹ / ₂	13	5 ¹ / ₂	8 ¹ / ₈	8 ¹ / ₈	⁷ / ₈ "
4 ⁵ / ₁₆	15	18 ¹ / ₂	11	5	1 ⁵ / ₁₆	15	7 ¹ / ₂	9 ¹ / ₄	9 ¹ / ₄	⁷ / ₈ "
5 ¹ / ₁₆	16 ¹ / ₂	19 ¹ / ₂	11	6 ¹ / ₈	1 ¹ / ₂	16 ¹ / ₄	6 ¹ / ₂	9 ³ / ₄	9 ³ / ₄	1 "
5 ⁵ / ₁₆	18	21 ¹ / ₄	12	7	1 ⁵ / ₈	17 ³ / ₄	7 ¹ / ₂	10 ⁵ / ₈	10 ⁵ / ₈	1 "
6 ¹ / ₁₆	21	26	14	10	3 ¹ / ₂	22 ¹ / ₂	7 ¹ / ₂	11 ¹ / ₂	14 ¹ / ₂	1 ¹ / ₄ "
8	24	29	14	8	2 ¹ / ₂	24	10	14 ¹ / ₂	14 ¹ / ₂	1 "
12	26	40	18	15	6 ¹ / ₂	35 ¹ / ₂	8	18	22	1 ⁵ / ₈ "

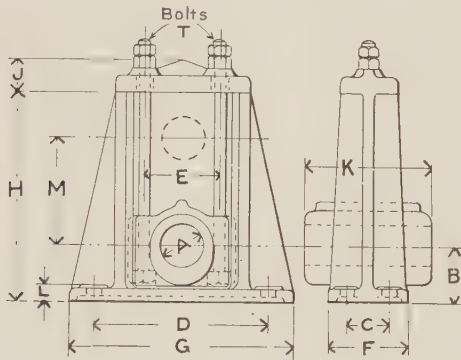
Dimensions
Solid Boxes.



A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	Bolts No. Dia
$\frac{5}{16}$	3	$5\frac{1}{4}$	4	1	2	$1\frac{1}{2}$	2 - $\frac{1}{2}$
$1\frac{3}{16}$	$3\frac{3}{4}$	$5\frac{1}{4}$	4	1	$2\frac{1}{2}$	$1\frac{1}{2}$	2 - $\frac{1}{2}$
$1\frac{7}{16}$	5	6	$4\frac{1}{2}$	1	$2\frac{1}{2}$	$1\frac{1}{16}$	2 - $\frac{1}{2}$
$1\frac{7}{16}$	5	6	$4\frac{1}{2}$	1	$3\frac{3}{8}$	$1\frac{3}{4}$	2 - $\frac{1}{2}$
$1\frac{11}{16}$	5	$6\frac{1}{2}$	$5\frac{1}{8}$	1	$3\frac{5}{8}$	$1\frac{7}{8}$	2 - $\frac{5}{8}$
$1\frac{13}{16}$	6	$7\frac{1}{4}$	$5\frac{3}{4}$	$1\frac{1}{2}$	4	2	2 - $\frac{5}{8}$
$2\frac{3}{16}$	6	$7\frac{3}{4}$	6	$1\frac{1}{4}$	4	$2\frac{1}{8}$	2 - $\frac{5}{8}$
$2\frac{7}{16}$	$6\frac{1}{4}$	8	6	$1\frac{1}{2}$	$4\frac{1}{4}$	$2\frac{3}{8}$	2 - $\frac{5}{8}$
$2\frac{11}{16}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$6\frac{1}{2}$	$1\frac{1}{2}$	$4\frac{1}{2}$	$2\frac{1}{2}$	2 - $\frac{3}{4}$
$2\frac{15}{16}$	7	9	$6\frac{3}{4}$	$1\frac{1}{8}$	$4\frac{3}{4}$	$2\frac{1}{2}$	2 - $\frac{3}{4}$
$3\frac{1}{16}$	9	10	$7\frac{1}{2}$	1	6	3	4 - $\frac{3}{4}$ $3\frac{1}{2}$ ∇
$3\frac{15}{16}$	12	14	11	$1\frac{1}{8}$	8	$3\frac{7}{8}$	4 - $\frac{3}{4}$ 5" ∇
$4\frac{7}{16}$	$13\frac{1}{2}$	$16\frac{1}{4}$	13	$1\frac{1}{2}$	$8\frac{1}{2}$	$5\frac{1}{2}$	4 - $\frac{3}{4}$ $5\frac{1}{2}$ ∇
$4\frac{15}{16}$	15	$18\frac{1}{2}$	15	$1\frac{15}{16}$	11	5	4 - $\frac{7}{8}$ $7\frac{1}{2}$ ∇

Adjustable Head-Bearings

With Wick-Oiling Boxes.



The Adjusting Bolts in this Bearing are used in Tension instead of Compression and the nuts are so placed as to be readily gotten at.

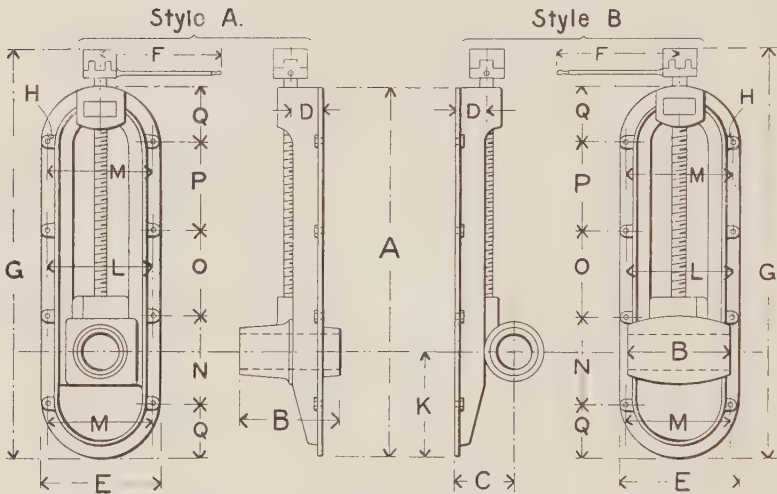
Nuts are used instead of Hand-Wheels because, for the usual service, Wrenches have been found far more satisfactory than the undersized Hand-Wheels sometimes used.

A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Inches	J Inches	K Inches	L Inches	M Inches	Bolts-T		Bolts in Base
												Dia.	Lnq.	
1 ⁵ / ₁₆	3 ⁷ / ₁₆	3"	13 ¹ / ₂	4 ¹ / ₂	5 ¹ / ₂	16	12 ¹ / ₄	1 ³ / ₈	6	1	5 ³ / ₄	7 ⁷ / ₈ "	14"	3 ³ / ₄ "
2 ⁷ / ₁₆	4 ¹ / ₁₆	"	"	"	"	"	"	"	8	"	5	"	"	"
2 ⁵ / ₁₆	"	3 ³ / ₄	14	5	6 ¹ / ₂	18	14 ¹ / ₂	2 ³ / ₈	9	1 ¹ / ₁₆	7	1"	16 ³ / ₄ "	"
3 ⁷ / ₁₆	4 ⁷ / ₁₆	"	14 ¹ / ₂	5 ⁹ / ₁₆	"	18 ¹ / ₂	15 ¹ / ₁₆	"	10 ¹ / ₂	"	"	"	17"	"
3 ⁵ / ₁₆	5 ¹ / ₈	4	16 ¹ / ₂	7	7 ¹ / ₂	21	19 ⁹ / ₁₆	3	12	1 ¹ / ₄	10	1 ¹ / ₈ "	22"	7 ⁷ / ₈ "
* 4 ¹⁵ / ₁₆	6 ³ / ₄	6 ¹ / ₂	20 ¹ / ₂	8 ³ / ₄	10"	24	21 ¹ / ₂	2	15	1 ¹ / ₂	11	"	23 ¹ / ₂ "	1"

* Made with curved guides for geared head

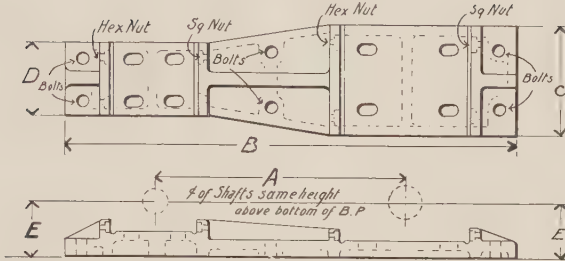
Dimensions of
Standard Take-ups.

The No. of Take-up indicates the length
of adjustment of the Box
in inches.



No	Max & Min. Bore	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	G Inches	H Bolts No Dia	K Inches	L Inches	M Inches	N Inches	O Inches	P Inches	Q Inches
4	$\frac{1}{8}$ - $\frac{1}{16}$	1 1/8	2 3/8	2 3/8	1 3/8	4	—	12 3/8	8 - 1/4	4	3 3/8	2 1/8	2 3/4	3 3/4	2 3/4	1 1/8
5	$\frac{1}{8}$ - $\frac{1}{16}$	1 3/8	3 3/8	2 1/2	1 5/8	4 7/8	—	14 3/4	"	4 1/2	4 3/8	3 3/8	3 1/4	4 3/8	3 1/4	1 5/8
7	$\frac{1}{8}$ - $\frac{1}{16}$	1 7/8	4 1/4	3	1 3/8	5 3/8	12	21 1/8	8 - 5/16	5 3/8	4 5/8	4	4 3/8	5 3/8	4 3/8	1 3/8
9	$\frac{2}{16}$ - $\frac{1}{16}$	2 1/8	5 3/8	3 3/8	1 7/8	6 3/8	12	25 5/8	"	6 3/8	5 3/8	5 3/8	5 3/8	5 3/8	5 3/8	3 3/2
12	$\frac{2}{16}$ - $\frac{1}{16}$	2 6	6 4	2	7 3/8	7 3/8	12	29 3/8	8 - 3/8	7 1/2	6 3/8	6 3/8	6 3/8	6 3/8	6 3/8	3 3/2
16	$\frac{2}{16}$ - $\frac{2}{16}$	3 3/2	7 4	2 3/8	8 3/8	8 3/8	18	38 1/2	8 - 5/8	9 3/8	7 3/8	7 3/8	6 3/8	9 3/8	6 3/8	5 3/8
20	$\frac{2}{16}$ - $\frac{2}{16}$	3 8/4	7 3/8	5 3/8	2 5/8	9 3/8	18	43 3/8	"	9 3/8	8 3/8	8 3/8	9 3/8	9 3/8	9 3/8	4 3/8
24	$\frac{3}{16}$ - $\frac{2}{16}$	4 5	10 6 1/2	3 3/8	11 3/8	11 3/8	18	49 3/8	"	11 3/8	9 3/8	9 3/8	11 3/8	11 3/8	11 3/8	6
36	$\frac{3}{16}$ - $\frac{2}{16}$	5 8/8	10 7 3/8	3 3/8	13 3/8	13 3/8	18	63 3/4	8 - 3/4	11 3/8	11 3/8	11 3/8	14 1/2	14 1/2	14 1/2	7 1/8

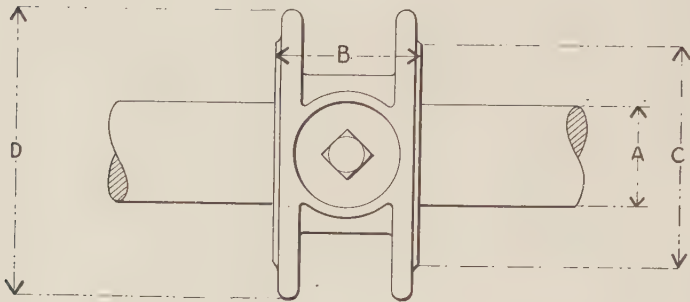
Base Plates for Equalizing Gears.



Pattern	Shafts	Gears	A Inches	B Inches	C Inches	D Inches	E Inches	Bolts
4233	2 $\frac{1}{8}$ -2 $\frac{1}{8}$	42-6	24	43 $\frac{3}{8}$	5 $\frac{3}{4}$	4 $\frac{3}{4}$	5	$\frac{3}{4}$ "
4026	2 $\frac{1}{8}$ -2 $\frac{1}{8}$	"	"	46 $\frac{3}{4}$	5 $\frac{3}{4}$	5	5 $\frac{1}{8}$	$\frac{3}{4}$ "
4148	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	"	"	44 $\frac{3}{4}$	6 $\frac{1}{2}$	5	5 $\frac{1}{8}$	$\frac{7}{8}$ "
4141	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	"	"	45 $\frac{1}{4}$	6 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{1}{8}$	$\frac{7}{8}$ "
4026	2 $\frac{1}{8}$ -2 $\frac{1}{8}$	56-8	32	54 $\frac{3}{4}$	5 $\frac{3}{4}$	5	5 $\frac{1}{8}$	$\frac{3}{4}$ "
4260	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	"	"	56 $\frac{1}{8}$	6 $\frac{1}{2}$	5	5 $\frac{3}{8}$	$\frac{3}{4}$ "
6533	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	"	"	53 $\frac{3}{4}$	6 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{1}{8}$	$\frac{7}{8}$ "
4425	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	"	"	58 $\frac{3}{8}$	8	5 $\frac{3}{4}$	6	$\frac{3}{4}$ "
3905	2 $\frac{1}{8}$ -4 $\frac{1}{8}$	"	"	56 $\frac{1}{8}$	8 $\frac{3}{4}$	8 $\frac{3}{4}$	7 $\frac{1}{8}$	$\frac{3}{4}$ "
4261	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	62 $\frac{3}{4}$	12	6 $\frac{1}{2}$	9 $\frac{3}{4}$	1"
4425	2 $\frac{1}{8}$ -3 $\frac{1}{8}$	64-9	36.57	58 $\frac{3}{8}$	8	5 $\frac{3}{4}$	6	$\frac{3}{4}$ "
5507	3 $\frac{1}{8}$ -4 $\frac{1}{8}$	"	"	66 $\frac{1}{8}$	11	7 $\frac{1}{4}$	8 $\frac{3}{8}$	$\frac{7}{8}$ "
4321	3 $\frac{1}{8}$ -4 $\frac{1}{8}$	64-13	38.25	67 $\frac{1}{2}$	11	7 $\frac{1}{4}$	8 $\frac{3}{8}$	$\frac{7}{8}$ "
"	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	67 $\frac{1}{2}$	11	7 $\frac{1}{4}$	8 $\frac{3}{8}$	$\frac{7}{8}$ "
3919	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	75-11	42.87	72	11	7 $\frac{1}{4}$	8 $\frac{3}{8}$	$\frac{7}{8}$ "
4261	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	73 $\frac{3}{8}$	12	6 $\frac{1}{2}$	9 $\frac{3}{4}$	1"
4096	3 $\frac{1}{8}$ -4 $\frac{1}{8}$	"	"	71 $\frac{1}{8}$	8 $\frac{3}{4}$	8	8 $\frac{1}{4}$	1"
6513	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	72	11	7 $\frac{1}{4}$	8 $\frac{3}{8}$	$\frac{7}{8}$ "
4010	3 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	74	12	8 $\frac{1}{4}$	9 $\frac{3}{4}$	1"
*5006	4 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	"	75 $\frac{1}{8}$	12	8 $\frac{3}{4}$	8 $\frac{1}{4}$ -9 $\frac{3}{4}$	1"
6477	3 $\frac{1}{8}$ -4 $\frac{1}{8}$ -5 $\frac{1}{8}$	"	42.87+20.70	93 $\frac{1}{2}$	12	8 $\frac{3}{4}$	9 $\frac{3}{4}$ -8 $\frac{1}{4}$ -6	1"

* Bases of Boxes - not centres - on same level.

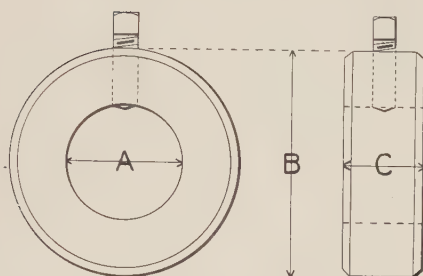
Dimensions of
Safety Collars.



A Inches	B Inches	C Inches	D Inches
$1\frac{5}{16}$	$1\frac{1}{2}$	2	3
$1\frac{3}{16}$	$1\frac{3}{4}$	$2\frac{3}{8}$	$3\frac{1}{2}$
$1\frac{7}{16}$	$1\frac{7}{8}$	$2\frac{3}{4}$	$3\frac{3}{4}$
$1\frac{11}{16}$	2	3	4
$1\frac{15}{16}$	$2\frac{1}{4}$	$3\frac{3}{8}$	$4\frac{3}{4}$
$2\frac{3}{16}$	$2\frac{5}{16}$	$3\frac{5}{8}$	5
$2\frac{7}{16}$	$2\frac{3}{8}$	4	$5\frac{3}{8}$
$2\frac{11}{16}$	$2\frac{7}{16}$	$4\frac{1}{4}$	$5\frac{5}{8}$
$2\frac{15}{16}$	$2\frac{9}{16}$	$4\frac{5}{8}$	6
$3\frac{3}{16}$	$2\frac{5}{8}$	$4\frac{7}{8}$	$6\frac{3}{8}$
$3\frac{7}{16}$	$2\frac{11}{16}$	$5\frac{1}{8}$	7
$3\frac{11}{16}$	$2\frac{3}{4}$	$5\frac{3}{8}$	$7\frac{1}{4}$
$3\frac{15}{16}$	$2\frac{13}{16}$	$5\frac{3}{4}$	$7\frac{1}{2}$
$4\frac{3}{16}$	$2\frac{7}{8}$	6	$7\frac{3}{4}$
$4\frac{7}{16}$	$2\frac{15}{16}$	$6\frac{1}{4}$	$8\frac{1}{8}$
$4\frac{11}{16}$	$3\frac{1}{8}$	$6\frac{1}{2}$	$8\frac{1}{2}$
$4\frac{15}{16}$	$3\frac{3}{16}$	7	$9\frac{1}{4}$
$5\frac{3}{16}$	$3\frac{1}{4}$	$7\frac{1}{4}$	$9\frac{1}{2}$
$5\frac{7}{16}$	$3\frac{5}{16}$	$7\frac{1}{2}$	$9\frac{3}{4}$
$5\frac{15}{16}$	$3\frac{3}{8}$	$8\frac{3}{8}$	$10\frac{1}{2}$

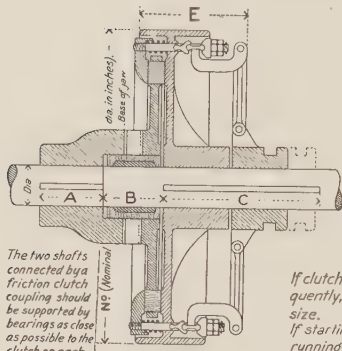
Dimensions of ***Solid Collars.***

All collars chamfered $\frac{1}{8}$ " on edge

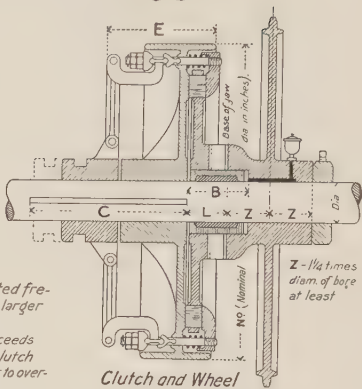


A Inches	B Inches	C Inches
$1 \frac{5}{16}$	$1 \frac{3}{4}$	$\frac{3}{4}$
$1 \frac{3}{16}$	$2 \frac{1}{4}$	1
$1 \frac{7}{16}$	$2 \frac{3}{4}$	$1 \frac{1}{8}$
$1 \frac{11}{16}$	$3 \frac{1}{8}$	$1 \frac{1}{2}$
$1 \frac{15}{16}$	$3 \frac{1}{2}$	$1 \frac{3}{4}$
$2 \frac{3}{16}$	$3 \frac{7}{8}$	2
$2 \frac{7}{16}$	$4 \frac{1}{8}$	2
$2 \frac{11}{16}$	$4 \frac{5}{8}$	$2 \frac{1}{8}$
$2 \frac{15}{16}$	$5 \frac{1}{8}$	$2 \frac{1}{8}$
$3 \frac{7}{16}$	$5 \frac{3}{4}$	$2 \frac{1}{4}$
$3 \frac{15}{16}$	$6 \frac{1}{2}$	$2 \frac{3}{8}$
$4 \frac{7}{16}$	$7 \frac{1}{8}$	$2 \frac{1}{2}$
$4 \frac{15}{16}$	8	$2 \frac{5}{8}$

Link-Belt Friction Clutches.



Clutch Coupling



Clutch and Wheel

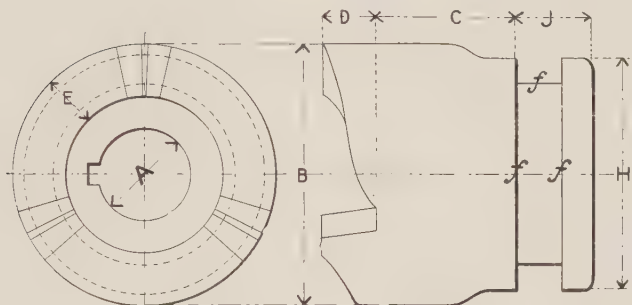
Note!
If clutch is operated frequently, use next larger size.
If starting load exceeds running load, use clutch of sufficient power to overcome the former.

N ^o (Nom. Dia.)	HP at 100 rev.	Min. and Max. Bore	A Inches	B Inches	C Inches	E Inches	L Inches
10	3.5	1 ⁷ / ₁₆ - 1 ¹⁵ / ₁₆	2 ³ / ₄	3 ¹ / ₄	7 ³ / ₄	6 ¹ / ₄	2 ¹ / ₁₆
12	6.7	1 ⁷ / ₁₆ - 1 ¹⁵ / ₁₆ 2 ³ / ₁₆ - 2 ⁷ / ₁₆	3 ¹ / ₄	3 ¹ / ₄	8	6 ¹ / ₂	2 ¹ / ₈ 2 ³ / ₁₆
14	11	1 ¹¹ / ₁₆ - 2 ³ / ₁₆ 2 ⁷ / ₁₆ - 2 ¹⁵ / ₁₆	3 ¹ / ₂	3 ¹ / ₄	9 ¹ / ₄	7	2 ³ / ₁₆ 2 ¹ / ₄
16	16	1 ¹⁵ / ₁₆ - 2 ¹ / ₁₆ 2 ¹⁵ / ₁₆ - 3 ⁷ / ₁₆	3 ³ / ₄	3 ³ / ₄	10	7 ³ / ₄	2 ³ / ₈ 2 ⁷ / ₁₆
18	27	2 ⁷ / ₁₆ - 2 ¹⁵ / ₁₆ 3 ³ / ₁₆ - 3 ¹⁵ / ₁₆	4 ¹ / ₄	4 ¹ / ₄	11	8	2 ³ / ₈ 2 ⁷ / ₁₆
20	38	2 ⁷ / ₁₆ - 2 ¹⁵ / ₁₆ 3 ³ / ₁₆ - 3 ⁷ / ₁₆ 3 ¹¹ / ₁₆ - 4 ⁷ / ₁₆	4 ³ / ₄	4 ³ / ₄	12 ¹ / ₂	8 ¹ / ₂	2 ⁷ / ₁₆ 2 ¹ / ₂ 2 ⁹ / ₁₆
24	60	2 ⁷ / ₁₆ - 3 ³ / ₁₆ 3 ⁷ / ₁₆ - 3 ¹⁵ / ₁₆ 4 ³ / ₁₆ - 4 ¹⁵ / ₁₆	5 ¹¹ / ₁₆	5 ⁵ / ₁₆	14 ¹ / ₂	10	2 ³ / ₄ 2 ¹³ / ₁₆ 2 ⁷ / ₈
28	90	2 ¹⁵ / ₁₆ - 3 ¹⁵ / ₁₆ 4 ³ / ₁₆ - 4 ¹⁵ / ₁₆ 5 ³ / ₁₆ - 5 ¹⁵ / ₁₆	5 ¹¹ / ₁₆	5 ⁵ / ₁₆	15 ¹ / ₄	10 ³ / ₈	2 ⁷ / ₈ 2 ¹⁵ / ₁₆ 3
32	125	3 ⁷ / ₁₆ - 4 ⁷ / ₁₆ 4 ¹¹ / ₁₆ - 5 ¹¹ / ₁₆ 5 ¹⁵ / ₁₆ - 6 ¹⁵ / ₁₆	6 ³ / ₄	6 ⁵ / ₁₆	17 ¹ / ₂	10 ³ / ₈	3 ³ / ₁₆ 3 ¹ / ₈

Jaw Clutches

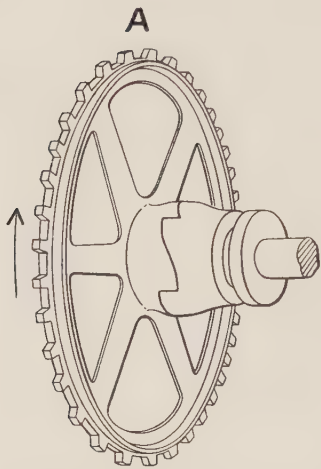
MADE WITH SQUARE JAWS OR SPIRAL JAWS.

CUT SHOWS R. H. SPIRAL JAW.

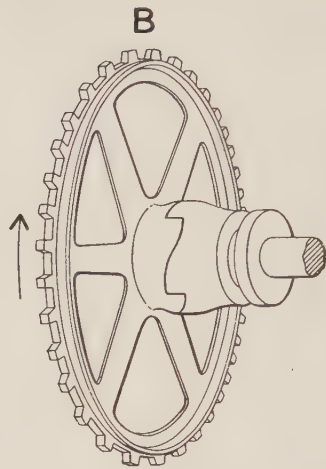


No. of Clutch	Square	Spiral	Bore A		Dimensions					
B	No. of Jaws		Heavy	Light	C Inches	D Inches	E Inches	H Inches	J Inches	
3	2	3	1 ⁵ / ₁₆	1 ⁷ / ₁₆	1/2	3/4	9/16	2 3/4	1	
3 1/2	2	"	1 3/16	1 1/16	1 1/8	13/16	11/16	3 1/4	1 1/8	
4	3	"	1 7/16	1 15/16	1 1/8	7/8	3/4	3 1/4	1 1/8	
4 1/2	"	"	1 11/16	2 3/16	1 3/4	15/16	7/8	4	1 1/4	
5	"	"	1 13/16	2 7/16	1 3/4	1	15/16	4 1/2	1 3/8	
5 1/2	"	"	2 3/16	2 1/16	2 1/4	1	1	5 1/4	1 1/2	
6	"	4	2 7/16	2 15/16	2 1/4	1 1/16	1 1/8	5 1/4	1 1/2	
6 1/2	"	"	2 11/16	3 7/16	2 1/4	1 1/16	1 1/8	5 3/4	1 1/2	
7	"	"	2 15/16	3 1/16	2 7/8	1 1/8	1 3/16	6 1/2	1 5/8	
7 1/2	"	"	3 3/16	4 3/16	3 3/8	1 1/8	1 3/16	7	1 3/4	
8	"	"	3 7/16	4 7/16	4 1/4	1 3/16	1 5/16	7	1 7/8	
8 1/2	"	"	3 11/16	4 15/16	4 1/4	1 3/16	1 5/16	7 1/2	2	
9	"	5	3 15/16	5 3/16	4 3/4	1 1/4	1 3/8	8	2 1/8	
9 1/2	"	"	4 3/16	5 7/16	5 3/4	1 1/4	1 1/2	8 1/4	2 1/8	
10	"	"	4 7/16	5 1/16	6 3/8	1 5/16	1 5/8	8 1/4	2 1/4	
10 1/2	4	"	4 11/16	6 3/16	7	1 5/16	1 5/8	8 3/4	2 1/4	
11	"	"	4 15/16	6 7/16	7 3/8	1 3/8	1 3/4	9 1/4	2 1/4	
12	"	"	5 7/16	7 3/16	8	1 1/2	1 13/16	10	2 1/2	
13	"	"	5 15/16	7 11/16	8 5/8	1 1/2	2 1/16	11	2 1/2	

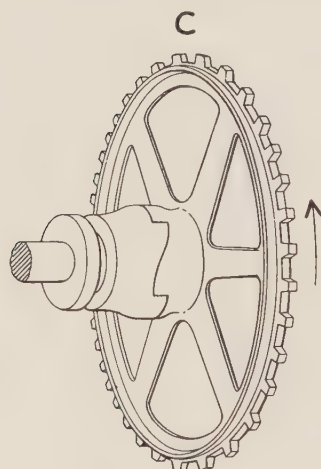
Different Arrangements of Spiral Jaw Clutches.



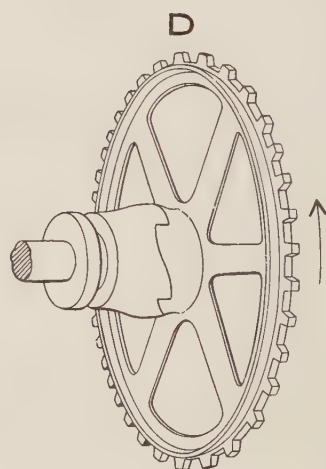
Clutch Drives Wheel
Right-hand Clutch.



Wheel Drives Clutch
Left-hand Clutch.

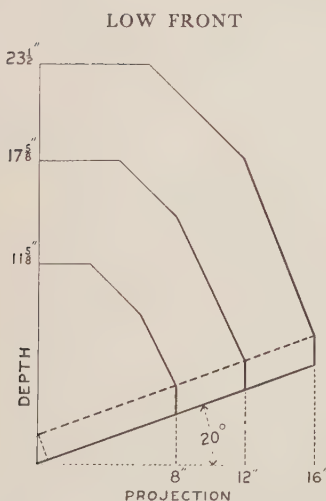
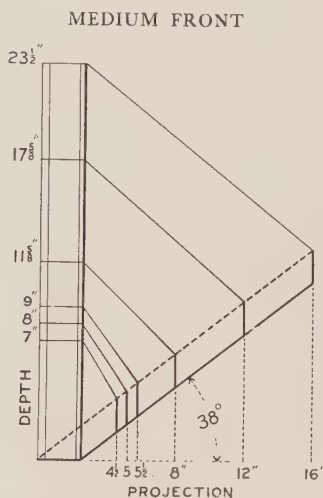
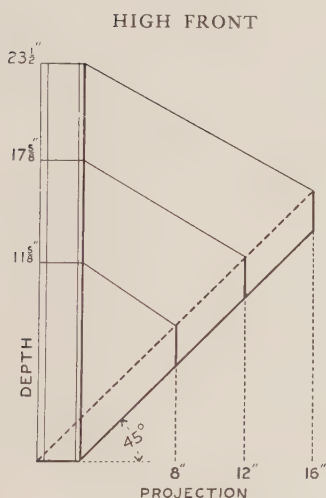


Clutch Drives Wheel
Left-hand Clutch.



Wheel Drives Clutch
Right-hand Clutch.

Relative Shapes of Standard Steel Buckets for Continuous Bucket Elevators



The maximum capacities of these buckets are given on page 255, but their actual capacities will depend upon the angle at which the elevator stands and the nature of the material handled.

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